

Acquisition and Transfer of Experiential Learning
from Rock Climbing to the Corporate Workplace

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Abstract

There were three purposes to this study. The first purpose was to determine how learning can be influenced by various factors in the rock climbing experience. The second purpose was to examine what people can learn from the rock climbing experience. The third purpose was to investigate whether that learning can transfer from the rock climbing experience to the subjects' real life in the workplace.

Ninety employees from a financial corporation in the Niagara Region volunteered for this study. All subjects were surveyed throughout a one-day treatment. Ten were purposefully selected one month later for interviews.

Ten themes emerged from the subjects in terms of what was learned. Inspiration, motivation, and determination, preparation, goals and limitations, perceptions and expectations, confidence and risk taking, trust and support, teamwork, feedback and encouragement, learning from failure, and finally, skills and flow. All participants were able to transfer what was learned back to the workplace.

The results of this study suggested that subjects' learning was influenced by their ability to: take risks in a safe environment, fail without penalty, support each other, plan without time constraints, and enjoy the company of fellow workers that they wouldn't normally associate with.

Future directions for research should include different types of treatments such as white water rafting, sky diving, tall ship sailing, or caving.

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CHAPTER ONE: THE PROBLEM

Introduction

The grand purpose of education is to prepare people for life in a modern society. For this study, education was defined as the “reconstruction or reorganisation of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience” (Dewey, 1916, p. 82). Cranton (1992) defined learning as any sustained change in thinking, values, or behaviour that is brought about by an educational experience. According to Cranton (1992), anything that anyone does as a part of life can be described as a learning experience.

Experience has played a pivotal role in education (Dewey 1938). Building on the work of Dewey and others, Kolb (1984) recognised the importance of experience in the process of learning. He emphasised the need for active participatory learning. Piaget (1970) realised that intelligence was enhanced as a result of experiential interaction between the individual and his/her environment. Experience is essential in education, because learning is a life-long pursuit (Kolb, 1984). Regardless of the nature of the experiences (personal, professional or educational), these experiences shape individuals’ understanding of the world around them, “the assumptions they make, the beliefs they hold, and the knowledge they have” (Cranton, 1992, p. 58).

At the time of this study, experiential education was defined by the Association for Experiential Education (AEE) as being a “process through which a learner constructs knowledge, skill, and value from direct experiences” (AEE, 1994, p. 1). Each experience provides a unique learning opportunity for each and every individual by “engaging them intellectually, emotionally,

socially, soulfully, and/or physically” (AEE, 1994, p. 1). Throughout the learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning.

The AEE mission statement explicitly stated that the experiential education movement, although committed to all settings, has its roots in adventure education (AEE, 1994). Keith King, aging philosopher, has likened adventure to education with these comments: “to learn is to adventure!....Learning and adventure are both delving into the unknown....That is experiential learning. However, adventure is just one type of experiential learning....” (King, 1988, p. 5).

Adventure is any experience with an uncertain outcome (Priest, 1990). Zook (1986) suggested that when individuals were faced with uncertainty, they reacted and coped with this difficulty or challenge. Reaction to this uncertainty, fosters self-awareness and self-esteem and became the basis of life-changing growth. Adventure provides what experiential educators call contextual learning and reinforcement: learning that occurs and is supported within the context of people’s actual daily life experiences.

Adventure education uses adventure experiences to create change in people. The process of adventure education involves placing people in situations fraught with risks and setting them tasks to accomplish. Initially, the risks appeared extremely dangerous and the tasks seemed insurmountable. However, by triumphing over the risks and accomplishing the tasks, people “learn to overcome almost any self-imposed perceptions of their capability to succeed....as a result, they learn a great deal about themselves and how they

relate to others" (Priest, 1990, p. 114).

The product of adventure education is change in interpersonal and intrapersonal relationships (Priest, 1990). Interpersonal relationships exist among people. Adventure brings change in trust, cooperation, communication, problem solving, and decision making to name a few. Intrapersonal relationships are within a person. Adventure brings change in self-concept, motivation, leadership potential, confidence, and willingness to take risks (Zook, 1986). These changes last if these new relationships are acquired during the adventure experience and are maintained in the learner's daily life. In other words, if people learn to feel, think, and behave positively in the adventure and continue this new learning when they return to their work, school or home life, then the adventure education is effective. When this lasting change happens, learning is said to have transferred from the adventure to reality (Gass, 1985).

Gass (1985) suggested that the true value of an adventure experience can be measured by how learning experienced during an adventure assists that learner in the future. He identified three types of transfer: specific, non-specific, metaphoric. Gass (1985) provided some examples from adventure education. The hand motions of belaying (a safety procedure in rock climbing) transfer specifically to the hand motions of rappelling (a descending technique in rock climbing). The cooperation among climbers (as each belays the other) transfers non-specifically into working with others on a job. However, if a climber sees the parallel between trusting personal safety to a belayer and trusting someone at work with confidential information, then that specific trust could be transferred metaphorically to the non-specific work situation.

However, this metaphoric transfer would only be effective if the parallels were strong, meaningful and relevant (Gass, 1985).

High metaphoric transferability is one of several reasons why corporations are jumping on the adventure education bandwagon (Latteir, 1989; and Prud'homme, 1990) at the time of this study. Despite the growing numbers of corporations who utilise adventure education for employee training and development, very little research had been conducted on the effectiveness of these kind of programs. Most works have focused on short-term acquired learning and a definite need existed for further longitudinal research into learning maintenance and transfer (Priest, Attarian & Schubert, 1993).

Problem Situation

As with any field, adventure education has had its share of "cowboy" providers (Zemke, 1988). The financial profit affiliated with running corporate programs makes this field especially attractive to beginning operators (Garvey, 1989). The credibility of the profession as a whole becomes damaged by the errors, weaknesses and shortcomings of a few "bad apples" (Chipkin, 1990). One practitioner with a misunderstanding of adventure education has had the potential to misuse the process. At best, this could have negated learning. At worse, this could have damaged the minds, bodies, souls and relationships of participants. The problem, according to Ewert (1983), is that adventure is a lot like electricity. We know it works, but we really do not know how or why. Incorrectly used, it can injure or even kill!

Dewey warned that experience could be miseducative when it prevented,

arrested or distorted the further growth of people. He emphasised the need for “rigour (sic) and discipline in learning, whether in the classroom or on a mountaintop” (Kraft, 1990, p. 179). The concern lay in a lack of information about what people learned, how they learned it, and whether it transferred. Adventure education has great potential for “use in the mainstream of our educational settings, whether in schools and colleges, in therapeutic programs, or in the worlds of business and industry” (Kraft, 1990, p. 182). Without such information, how can practitioners possibly do justice to such a potentially powerful method of learning? In an effort to better understand the process and products of adventure education, this study aimed to examine the learning context, material and transfer of one adventure experience: rock climbing.

Rock climbing is representative of a typical adventure experience with all the common hallmarks (Gass, Goldman & Priest, 1992). This activity is experiential; it perceives dangers, yet is quite safe. Rock climbing is dramatic, exciting and emotional, thus focusing attention and sharpening minds, so people remember what they have learned. Rock climbing is conducted outdoors on a natural cliff face or indoors on an artificial wall. The action is holistic: engaging many of the senses, accommodating a variety of learning styles, and addressing all the domains of learning. Rock climbing is fun; tasks are concrete and intriguing; therefore, people are motivated to learn.

Not only is this activity suitable as an adventure experience, it also fits with a corporate culture. It is novel: an unusual activity done in a unique context with an uncertain outcome. No one is an expert, subjects participate as equals without hierarchical barriers or apprehensions, which often exist in organised groups. Rock climbing is consequential, as people learn from their mistakes. It

has clear and simple goals. This provides immediate feedback on performance regardless of success or failure. These successes and failures are self-determined and are supported by significant others. The metaphors in play are meaningful and relevant to real life, especially in a corporate world.

Purpose Statement

The purpose of this study was three-fold. The first purpose was to determine how learning can be influenced by various factors in the rock climbing experience. The second purpose was to examine what people can learn from the rock climbing experience. The third purpose was to investigate whether that learning can transfer from the rock climbing experience to the subjects' real life in the workplace.

People can gain a variety of specific, non-specific or metaphoric learning from adventure experiences like rock climbing. Specific learning includes particular skills unique to the learning activity. The actual rock climbing techniques of belaying, knot tying and moving on rock are examples of specific skills matched to this adventure activity. Non-specific learning includes general skills common to many different settings. The behaviours of trusting, cooperating, and communicating are examples of non-specific learning, because they are useful in rock climbing, family or social life, and on the job. Metaphoric learning relates to a subset of non-specific learning where general skills are learned and applied to very different, but parallel settings. Gaining confidence, motivation, and a willingness to take risks are examples of metaphoric learning, but only if these are useful in both rock climbing and the

workplace and if the two settings can be analogously connected by the learner. For example, overcoming the challenge of a climb could be likened to surmounting the difficulty of a heavy workload. If so, then the strategies used for success in rock climbing could be applied to hurdle the workload obstacle.

This new learning can transfer from the adventure experience to the workplace. The specific learning of rock climbing skills (belaying, knot tying and moving on rock) has rarely been applied in a corporate workplace and so no transfer would be expected. The nonspecific behaviours (trusting, cooperating, and communicating) have frequently come in handy when working with other people and so transfer would be desired. The metaphoric skills and behaviours (confidence, motivation, and a willingness to take risks) are useful and desirable. However, metaphoric transfer would only take place if the participant had made analogous connections between the two learning environments and if barriers to transfer were absent.

Research Questions

In summary, this study asked three pairs of research questions: 1) What type of experience did the subjects have and how might this have influenced their learning?, 2) What did they learn from the experience and how could they apply this at work?, 3) Did their new learning transfer to their jobs and what metaphoric forces enhanced or interfered with the transfer?

Rationale

This study met the need for further research into adventure education, corporate programming and rock climbing. Warner (1990) called for the development of a strong base of research and evaluation in adventure education as a means to establish professional credibility and bring much needed change. He wrote: "As more practitioners and researchers work to put the ideas into practice at the local level, the discipline will be strengthening its evaluation and research base, and the process of change will gain momentum" (Warner, 1990, p. 319). This study aimed to strengthen the data base with its results.

"The greatest concern for the proponents of corporate [programming] lies in substantiating claims that the training is valid and reliable. Plenty of testimonial and anecdotal evidence [exists], but...a definite need exists for further research to generate hard data on the utility and efficacy of this training" (Priest, Attarian & Schubert, 1993, p. 19). This study aimed to generate such data.

Rock climbers consider their sport one of the purest forms of human activity, partly because it is a private experience rather than a public event (Csikszentmihalyi, 1975). As such, very little is known about the experience. Previous researchers have called for a deeper understanding of rock climbing (Hamilton, 1979; Lefebvre, 1980; Robinson, 1985; Iso-Ahola, La Verde & Graefe, 1988; Attarian, 1991; Ewert, 1985; Delignieres, Famose, Thepaut-Mathieu, & Fleurance, 1993). This study aimed to probe into the privacy of rock climbing experiences.

This study also answered critical questions about the adventure experience,

learning and transfer. Klint (1990) suggested that “inquiry into the adventure experience needs to move into the next stage, from describing the product to understanding the process” (p. 169). She recommended the use of both qualitative and quantitative methods to examine the holistic understanding of the essence of the adventure experience. This study used both methods to examine the processes of learning.

In a speech to the adventure education field on the 50th anniversary of Outward Bound, Priest (1991) called for future research into learning and transfer. Research was needed to establish “the extent to which... transfer occurs and lasts over time, and on the relative contributions of specific program elements (such as duration or length of courses, content or mix of activities, and format of presentation or style of instruction) to the extent and lasting impact of that transfer” (Priest, 1991, p. 3). This study intended to establish the learning/transfer connection. The outcomes of this study may prove beneficial for the experiential education profession and its practitioners. Any study with positive outcomes may add to the reputation of the profession. Given that this study was not trying to “prove” anything, but intended to discover, its outcomes should make a positive contribution to the profession’s credibility. This study also enabled practitioners to understand how and why rock climbing is useful in experiential and adventure education. Since practitioners are using rock climbing in a variety of programs for achieving recreational, educational, developmental and therapeutic goals, they could be more successful given a better understanding of the process. Equipped with this understanding they could increase the learning of their clients and enhance the transfer of that learning.

Lastly, this topic was of great personal interest to the researcher. A climbing instructor at the time of the study, he has experienced the individual growth that comes from rock climbing. He has witnessed the change in others which comes from their rock climbing. These gains have included greater confidence, motivation, self-efficacy and sensible risk taking. As a result of these experiences, he has celebrated the potential of this activity to provide similar learning opportunities for others. Rock climbing allows an individual to learn more about the capabilities of the mind, body, and soul. It provides powerful learning that only the individual can interpret. Therefore, rock climbing warrants further personal attention. To this end, the researcher acknowledges that his objectivity may have been slightly biased by these beliefs.

Definitions

For the purpose of this study, **adventure** is any undertaking with an uncertain outcome (Priest, 1990), where the uncertainty is created by the presence of risk. **Risk** is the potential to lose something of emotional, social, physical or financial value (Carpenter & Priest, 1989). **Competence** is the capability (attitude, behaviour, knowledge, confidence, experience, and skill) needed to deal effectively with the demands created by the surrounding environment (Carpenter & Priest, 1989). **Challenge** is the interplay of risk and competence (Priest & Baillie, 1987). Varying mixes of risk and competence can blend together and give five conditions of challenge: **exploration and experimentation, adventure, peak adventure, misadventure, and devastation and disaster** (Mortlock, 1984; and Martin & Priest, 1986).

A number of factors are in play during adventure experiences. **Optimal Arousal** (Ellis, 1973) is the interaction between arousal and performance which is most conducive to high level performance. **Eustress** occurs when people “own” their success while engaged in an experience; and **distress** happens when people “own” their failures while engaged in an experience (Seyle, 1974). **Self-efficacy** (Bandura, 1977) is the certainty of belief that people can accomplish tasks which test their abilities in risk taking situations, and is more than mere self-confidence. **Sensation seeking** is the need for intense stimulations and of new, complex and varied experiences (Zuckerman, 1979), where the individual is prone to assume physical and social risks. **Flow** describes a state of mind that is “engrossing, intrinsically rewarding and outside the parameters of worry and boredom” (Csikszentmihalyi & Csikszentmihalyi, 1991, p. 150).

A few theories help to explain performance. **Peak performance** is defined as “behaviour that exceeds one’s predictable level of functioning, represents superior use of potential in any endeavour” (Privette, 1981a, p. 57). **Locus of control** occurs when individuals attribute the reasons for their success or failure to a variety of causes such as ability, effort, luck, task difficulty, fatigue, weather, equipment or attention (Weiner, 1972, 1985; Russell, 1982). Locus of control can be internal (attributed to self) or external (attributed to outside influences). **Extrinsic responses** are negative or positive comments from significant others, and **intrinsic feelings** can be either negative or positive feelings of oneself (Priest, 1993; and Klint & Priest, 1992). **Motivation** is described as the direction and vigour of behaviour present when an individual knows his/her performance will be evaluated in a manner that would

subsequently enable success or failure to be determined (Atkinson, 1964).

Several theories have been suggested to explain behaviour. **Effectance motivation** (White, 1959) happens when people are intrinsically motivated to gain control over their environment through repeated mastery attempts or by trying to perform successfully and stay in control. **Competence motivation** (Harter, 1978) includes the effects of social or interpersonal factors and the effects of positive or negative experiences. Motivation revolves around the perception of competence. **Risk-competence effectance** is the belief that “one’s competence, if correctly perceived, [can be] used to effect the probabilities of success or failure and their resulting consequences” (Priest, 1993; and Klint & Priest, 1992).

Learning is the acquisition of new knowledge, new behaviours or new attitudes (Cranton, 1992). **Transfer** is the retention, maintenance and application of that new learning in a situation different from the initial learning setting (Gass, 1985).

Delimitations

This study employed rock climbing as the adventure education treatment. Therefore, the results of this study should not be generalised to other forms of risk activity, such as white water rafting or mountaineering.

This study measured only a few aspects of a rock climbing experience: risk, competence, self-efficacy, locus of control, motivation, success and failure. Therefore, the results of this study should not be generalised to other aspects of a rock climbing experience such as cognition or fitness.

This study examined the learning experiences and behaviour patterns for employees of a Canadian financial corporation. Therefore, the results of this study should not be generalised to other kinds of employees or corporations.

Limitations

Limitations to this study were subject selection, design control, testing effect, experimenter bias, and sample mortality. Subjects were volunteers, but this was a necessary requirement of ethical adventure education. Participants must not be coerced and must be allowed to select their own levels of engagement under the axiom of “challenge by choice” (Hunt, 1991). Nevertheless, using volunteers meant the sample could not have been fully randomised.

Since subjects interacted with one another at work over the two-week treatment period, and during the month after climbing and before being interviewed, exerting control over the research design was difficult. Subjects may have shared information that could have biased the responses of other subjects not yet treated.

The repeated use of two similar questions on all tests (rating risk and competence) could have caused a testing effect. Subjects may have gotten used to these questions and over time may have responded quickly and without taking the time to think about their answers.

Without a control group, the researcher was not able to determine if change was due to factors other than the treatment. For example, just getting away from work could have had some positive learning effects.

Subjects may have been affected by the instrument used in the study. The

mere completion of a survey or interview may have served to focus the subjects' learning in a way that might not have taken place without the research.

Experimenter bias could have arisen when the researchers involved in the study might have become inconsistent in their actions, while conducting the same measures or performing the same instructional tasks over a span of two weeks. This could have meant that subjects received slightly different treatments or some measurements may be off.

Since the study took place over several months, sample mortality could have had an impact on the study. Out of 90 original subjects, 15 failed to show up for their scheduled treatment session. Although never surveyed, questioned, or interviewed, this sixth of the starting sample could have made an important contribution. When asked for an interview at a later date, other subjects may have refused because they had enjoyed the rock climbing but were not really being interested in talking about it.

Assumptions

Since rock climbing is an accepted adventure activity, frequently used in experiential education, this study assumed that this treatment also fulfilled the necessary criteria for learning. For example, was it meaningful or informative enough to change the participant's behaviour? Therefore, the study assumed that the treatment would have the potential to bring about learning for the subjects. However, the collected quantitative data were analysed to make certain rock climbing fulfilled the criteria for an adventure experience and to

determine if the treatment was powerful enough to have enabled learning. Since the constructs examined were personal and self-reported, this study assumed that subjects' responses were honest and indicative of their true feelings.

CHAPTER TWO: LITERATURE REVIEW

Once again, this study had three purposes: to determine how learning could be influenced by various factors in a rock climbing experience, to examine what people could learn from that experience, and to investigate whether their learning had transferred from the rock climbing to the subjects' real life in the workplace. Therefore, this review addressed literature related to these three purposes. The section on rock climbing summarised the effects that climbing had on individuals. The sections on adventure summarised the research on the adventure experience and the learning that takes place as a result of adventure. The section on transference outlined the philosophies and strategies for optimising the transfer of learning through rock climbing. Furthermore, the methods for this study were both quantitative and qualitative. Therefore, this review also addressed literature related to both methodologies.

Literature Related to Rock Climbing

This study utilised the activity of rock climbing as a treatment. Rock climbing developed out of the older and more general activity of mountaineering. Over the past several years, the sport of rock climbing has grown in popularity; along with this was the increased number of instructional programs provided by schools, recreation departments, and private recreation agencies (Attarian, 1987). Climbers consider their sport one of the purest forms of human movement, partly because climbing achievement is a private autonomous experience rather than a public event (Csikszentmihalyi, 1975). Climbing is usually done without an audience, and no one but the climber realises what

he/she has accomplished or how well it is done.

Several researchers have stated that participation in rock climbing has many associated benefits. Successful climbing experiences elevates people's feelings and moods (Locke, 1967), produces a greater sense of personal control and internal attributions (Weiner, 1973), enhances intrinsic motivation (Deci & Ryan, 1987), and increases self-efficacy (Bandura, 1982). Climbing provides its users with a wide variety of emotional and aesthetic rewards. This allows an individual to view scenery, overcome hardship in the company of friends, and allows him/her to experience the mental and physical joys of exertion and challenge (Hamilton, 1979). People climb because of the challenge, the catharsis, the recognition, creative opportunities, locus of control and for the physical environment (Ewert, 1985). Climbers seek both a sense of personal accomplishment and recognition for their accomplishments by other climbers (Hamilton, 1979). Rock climbing primarily contributes to increased self-confidence, recognising and overcoming fear, and development of stress coping strategies (Martin, 1991).

Rock climbing also involves risk taking. Carney (1971) stated that without risk present in an individuals life, there would be no fulfillment, no distinctively human sort of life. Risk is essential to keep the mind, body and spirit up to speed (Keyes, 1985). Therefore, people seek and engage in risks like rock climbing to enhance their life.

All adventures involve some element of risk. The presence of risk gives rise to the uncertainty which marks an experience adventurous (Carpenter & Priest, 1989). Helms (1984) stated that only confident and capable climbers, who had a positive self-image and sufficient control over uncertainty, could meet the

challenge and goals that they require. Easy climbs allow them to gain friendships and physical conditioning, and to develop with a sense of enjoyment from being in the mountains.

Climbers promote uncertainty to maintain their level of motivation towards the climb. According to Emerson (1982) climbers who maintain this level of uncertainty create a similar level for achieving their goals. Furthermore, this allows them to be more willing to accept higher levels of risk. Climbing employs an adventurous experience which acts as a vehicle for individuals to learn more about and improve interpersonal and intrapersonal skills which are useful in their lives (Goldman, 1990). Iso-Ahola, La Verde and Graefe (1988) stated that rock climbing is both physically and mentally demanding, with the emphasis placed on the establishment and fulfillment of personal and group goals with the opportunity to experience and master stressful situations.

Literature Related to Rock Climbing Research

Research on rock climbing has been limited in the past. After an extensive and exhaustive literature search only eight studies could be found directly related to rock climbing. These eight studies were abstracted and critiqued in order of relevance to this study.

The motivational dimensions for participation in mountain climbing was examined by Ewert (1985). During the summer of 1983, he surveyed 460 climbers (80% male, average age of 30 years) prior to their intended ascent of Mount Rainier with a questionnaire which contained 40 motivational statements. These statements were selected from Crandall's (1980) work on

leisure motivation. Subjects were asked to rate the importance that they held for each statement (on a 5-point modified Likert scale) and to self-identify their level of climbing experience (novice/beginner or intermediate/advanced). Ewert then categorised the climbers on the basis of their self-identity, as either inexperienced (38%) or experienced (62%) respectively. Using factor analytical techniques with principle components extraction (Eigen values >1.0) and varimax rotation (loading coefficients >0.35), he found six factors: challenge/risk, catharsis, recognition, creativity, locus of control, and physical setting. Experience played a role in influencing an individual's motivations for climbing. Ewert found that individuals who were relatively inexperienced often had different motives for participation than those with higher experience levels. Ewert stated that for the inexperienced climber the items of recognition, escape, and social activities appeared to be more important. Items of exhilaration, challenge, personal testing, making decisions, and locus of control were more descriptive of the experienced climber. Ewert's article laid down some of the ground work related to the motives of climbers. As a result of his work, several interactions were established which outlined the connection between motivation and rock climbing.

One study which attempted to gain further insight into the psychological aspects intrinsically related to rock climbing behaviour was conducted by Lefebvre (1980). He administered a 18-item questionnaire to 96 undergraduates (61% male and 39% female) in Physical Education. The questionnaire was completed at various times during a rock climbing experience that consisted of climbing on a 96-foot sheer rock-face. Subjects were asked to circle the number corresponding to their experience during the

particular activity on 7-point Likert scale. Items were drawn from the semantic differential literature and had a satisfactory median reliability of $r=.89$. Using factor analytical techniques, he found three factors: activity-potency (body sensations); control (sense of competence); and evaluation (self-appraisal). He concluded that a stronger sense of competence and a more positive self-appraisal occurred at the end rather than at the beginning of a climb. Further results suggested that feelings of unhappiness, weakness, and smallness were associated with the beginning of a climb and that feelings of strength, persistence, bigness, and goodness were associated with reaching the top of a climb. Subjects were labelled as having an energetic attitude at the beginning, a reduced vitality at the middle of a climb, and self-assurance, power, and happiness at the end of a climb. Expert climbers enjoyed the chance to discover the best combination of moves in order to find the intrinsic rewards in performing on the rock face; while inexperienced climbers considered rock climbing more in terms of achieving a task by getting through the stressful parts of a climb. Lefebvre found that individuals' feelings before a climb were more positive, whereas, in the middle phase of a climb, many seemed to perform the crux with a reduced vitality.

Iso-Ahola, La Verde, and Graefe (1988) conducted a study which tested whether or not perceived competence mediated the effects of participation in risk recreation or sports on self-esteem. During the fall of 1984, they interviewed 182 climbers at Seneca Rocks, West Virginia: 95 before the day's climb, 64 after the day's climb, with the remaining 23 being surveyed with a questionnaire which contained 20 self-esteem statements. These statements were selected from Rosenberg's (1965) Self-Esteem Scale. Subjects were

asked to rate the importance that they had for each statement (on a 4-point modified Likert scale). They were also asked to identify their level of climbing experience (beginner/novice, intermediate, advanced, and expert), climbing skill (poor, fair, average, good, very good), highest degree of difficulty climbed (a 12-point scale from 5.0 to 5.11 based upon the Yosemite Decimal System), and the highest degree of difficulty while leading others (5.0 to 5.11, as above). Iso-Ahola, La Verde, and Graefe then asked for personal demographic information, expectations of climbing, previous climbing experience, and number of climbing trips engaged in each year. Subjects who were interviewed (before and after their climbs) were mostly single (70% and 72%) and male (74% and 84%, respectively). The climbing club members consisted of both married (48%) and single (44%) individuals, of which the majority were male (74%). The mean age of the three groups were 27.4 (before climb), 27.6 (after climb), and 37.4 (club members). Using multiple regression analysis, they found that the number of years' experience and the number of climbing trips would significantly contribute to a subject's perceived competence. These findings indicated that climbers felt more competent about climbing in general as they gained experience. The more climbing experience one had, the higher his/her general perceived competence. However, this competence did not create a greater sense of self-esteem.

Stress-seeking in terms of psychological characteristics associated with successful long-term involvement in rock climbing was examined by Robinson (1985). He administered a survey to 30 elite rock climbers. Subjects were interviewed by assessing four behavioural characteristics: sensation seeking (Zuckerman, 1979); trait anxiety (Spielberger, Gorsuch, & Lushene, 1970);

need for achievement (Atkinson, 1964); and affiliation (Alderman, 1974). Subjects were asked to identify their level of climbing experience (elite or non-elite), and their type of participation (recreational or competitive). These climbers then rated the importance held for each statement: filling in personal demographic information, additional comments, personal insights, and anecdotes. Subjects were 100% male, with an average age of 27.3 years. Forty percent of the subjects were climbing instructors from Vancouver, British Columbia; 20% belonged to a climbing club from England; and 40% were climbers interviewed at Yosemite Park, California. The average number of years climbed was 9.11; and lead climbing ability ranged from 5.8 to 5.12. Results of this study concluded that elite rock climbers were high in sensation seeking, were generally categorised as being low in anxiety both in daily life and in rock climbing, appeared to possess a moderate to high need for achievement, and had moderate to high on affiliation. Robinson found that the behavioural characteristics of sensation seeking, trait anxiety, need for achievement, and affiliation displayed by these rock climbers helped to explain their attraction to this form of high-risk sport.

The judgment of the Rating Scale of Difficulty (RSD) which used rock climbing was tested by Delignieres, Famose, Thepaut-Mathieu, and Fleurance (1993). Fifteen highly skilled climbers participated by climbing 27 different routes on an artificial climbing wall. They were asked after each climb to rate its difficulty according to the RSD. They were further asked to estimate, using the magnitude estimation method, difficulty, exertion and required accuracy. This method was taken from the work of Stevens (1957, 1968/69) concerning difficulty, exertion, and motor accuracy. Electromyographic data were collected

on the right upper arm, aiming to evaluate expended exertion. Subjects were expert climbers, with an average age of 26 years. Their averaged skill level was 5.12 (extremely high) on cliffs. Multiple regressions were used to examine difficulty, exertion, and accuracy, which found that perceived exertion seemed to have more weight in the estimation of difficulty than accuracy. Climbers developed a specific expertise relative to the use of RSD, but this expertise was confined to the range of difficulties with which they were familiar. Therefore, this finding confirmed that their judgment was based on a comparison between the actual level of perceived difficulty and a representation of the levels of difficulty which were perceived corresponding to each degree of the scale.

A study that attempted to gain further insight into why people climbed mountains was conducted by Bratton, Kinnear, and Koroluk (1979). They administered a questionnaire to members of the Alpine Club of Canada, collecting 266 subjects for the study. The questionnaire examined the possible reasons for climbing. Subjects were asked to rate the importance that they held for each statement (on a modified 5-point Likert scale) with some written answers to self- identify their level of climbing experience (novice/beginner or intermediate/advanced) and type of preferred climb (general alpine, hard rock, steep ice, hill walker, or expedition). Bratton, Kinnear, and Koroluk then asked for personal demographic information, present climbing habits, previous climbing experience, present and previous participation in sport activities, and reasons for climbing. Subjects were 80% male, with an average age of 30 years and 85% of the subjects were alpine mountaineers with 54% of subjects ranked as having had an intermediate level of experience. Using factor analytical techniques they found eight factors: social experience, health and

fitness, excitement, expressive, relaxation, competitive achievement, noncompetitive achievement, and love of nature. Results of this study suggested that the most important reason that people climb was to enjoy the wilderness, fresh air, and nature. Individuals also participated for reasons of exercise, recreation and relaxation, and self-testing or achievement.

Recognition was unimportant according to this study because climbers were not motivated to gain status through climbing. Male motivations towards self-testing/achievement and challenge were much higher than for females. Need for achievement and quest for status motivated the younger climbers, and these younger climbers used climbing to get away from regular routine. Age, ability, and sex were three of the stronger determining variables that influenced motivation. Bratton, Kinnear, and Koroluk found that individuals had positive linear relationships between self-assessment of climbing expertise and goal conquering. Their results indicated that when a climber's ability increased, more challenging goals were selected. Items of less external rewards which consisted of exhilaration, challenge, personal testing, making decisions, and locus of control were more descriptive of the experienced climber.

Ewert (1994) examined the motivations for high altitude mountaineering. During the months of June and July, 1990, he surveyed 360 climbers after their ascent of Mount McKinley in Denali National Park, Alaska with a questionnaire which contained 50 motivational statements. These statements were specifically designed to elicit motivational responses relative to climbing at Mount McKinley and were selected on their ability to measure recreation-based motivations from the previous works of Ewert (1985), Crandall (1980), Driver (1977), and Manning (1986). Subjects were asked to place a slash across a 10

cm line at the point which best represented the level of importance that each statement had towards them. This scale ranged from not important (0 cm) to very important (10 cm). Ewert then had subjects self-identify their level of climbing experience as either: beginner (3.6%), novice (30.1%), intermediate (51.5%), or highly experienced (14.5%). Subjects were 90.3% male, with an average age of 32.3 years. Using factor analytical techniques with principle components extraction (Eigen values >1.0) and varimax rotation (loading coefficients $>.40$), he found four factors: exhilaration/excitement, social aspects, image, and aspects of climbing. Exhilaration and excitement appeared to be important components for the high altitude mountaineer. Ewert suggested that motivations for participation depended on the level of experience of the individual. Experienced climbers were climbing for reasons other than risk or danger. His findings suggested that participants in risk recreation reported different patterns of motivations that were related to their particular level of experience.

A study that examined the importance that an individual attached to participation was conducted by McIntyre (1992). He suggested that a positive relationship existed between intrinsic motives and levels of engagement based on self-reported levels of experience of participants in risk recreation. The study consisted of 118 rock climbers (24 were members of a rock climbing association, 32 were graduate students in an outdoor pursuits course, and 62 were interviewed on-site at three climbing areas in eastern Australia). A self-administered questionnaire requested various details as to climbing experience which included a self-assessment of climbing experience on a 5-point scale from novice (1) to expert (5), and an estimate of climbing expertise

based on the highest climbing grade. The importance of rock climbing as compared to other outdoor recreation activities was estimated on a scale from “least important” (1) to “most important” (5). Motives or reasons for participation in rock climbing were measured using 16 items selected from Ewert’s (1986) mountaineering study. Three independent discriminant analyses were conducted to determine the motivations based on skill level or expertise, level of experience, and commitment/involvement. The results suggested that a pattern of motivation shift predicted by Ewert and Hollenhurst (1989) could be demonstrated for levels of engagement that used objective measures of the highest grade climbed as a basis for estimated skill and expertise levels.

Critique of Articles

In summary of these eight works, a critique and an examination of their relevance to this study was warranted. Ewert’s first research was relevant to this study because it examined the motives for rock climbing, and proved to be useful in obtaining a link in understanding what a climber would learn as a result of rock climbing.

Lefebvre’s study was 15 years old and lacked some of the current changes that had occurred over those years regarding rock climbing. The results of the article were vague and suggested that a need for further research existed in this area. However, it further explored some of the variables that would be used in this study such as competence and self-appraisal.

Iso-Ahola, La Verde, and Graefe’s study did an excellent job at examining the effects of perceived competence relevant to rock climbing. However, the

information was somewhat outdated because the results were collected 11 years ago. Competence was a major variable highlighted in the article and was one variable examined in this study. The results indicated that while climbers felt more competent about their climbing skills, this feeling did not translate into a feeling of general competence.

Robinson's study was somewhat brief and vague in how his research was conducted. It examined what encouraged individuals to participate in such a high risk activity. His research was 10 years old and was not currently up to date with the changes in the world of climbing. Robinson's study was important in understanding why individuals engaged in high risk activities and what they gained personally as a result of rock climbing.

Delignieres, Famose, Thepaut-Mathieu and Fleurance's study was good because it was current and examined an important issue related to the world of climbing: rating of routes and perception of difficulty. Their study was somewhat confusing in parts but did conduct an important experiment concluding with relevant results. Their study was important because it examined perceptions related to rating the difficulty of a climb. This was an area examined in this study.

Bratton, Kinnear, and Koroluk's study was definitely outdated, as it was written in 1979; the data analysis was very weak because it was extremely vague in describing their methodology and the results were unimportant due to the changed attitudes and abilities of rock climbers. However, it was a good article which examined what motivated climbers two decades ago. The factor of self-testing and achievement was important because they were variables that were examined in that particular study.

Ewert's second study was good because it examined climbing motivation in relation to experience. His study was very thorough and produced concrete results based on current research. Ewert's research was useful for this study because it examined experience and motives and how these were tied to the theories of optimal arousal and flow.

The results of McIntyre's study were relatively good and suggested that a need for further research in this area existed. It explored two of the variables that were used in this study: experience and motivation.

Literature Related to the Adventure Experience

The adventure experience has been characterised by its potential to enhance human development in the physical, cognitive, and affective domains (Ford & Blanchard, 1985). According to Klint (1990), many benefits are associated with each domain. Increased strength, cardiovascular capacity, and muscular endurance are a few within the physical domain. Cognitive development occurs with enrichment of knowledge associated with a variety of topics, which include the environment, activity skills, and safety skills. Self-concept, motivation, feelings of well-being, a sense of achievement, and stress control represent a few benefits of the affective components that are influenced by a risk taking adventure experience.

The role of perceived risk in influencing choice of leisure activities was assessed by Cheron and Ritchie (1982). They administered a questionnaire to 68 adults that asked them to rate 20 leisure activities and the amount of perceived risk associated with each activity. Perceived risk was measured

using a 9-point rating scale (1= low risk, and 9= high risk). Subjects were further asked to rate these activities via a graphic positioning scale which asked respondents to position key letters that indicated the degree of risk they perceived to be connected with each activity. In addition to these measures of perceived risk, subjects indicated their degree of familiarity, interest, and preference concerning each of the 20 leisure activities. Standard demographic information was also gathered from each subject. Subjects were 91% male with an average age of 28.4 years; 61% were professionals, 18% were students, 18% were teachers, and all were university graduates. Cheron and Ritchie examined eight factors that pertained to perceived risk: financial, functional, physical, psychological, social, satisfaction, time, and overall risks. Results of the study concluded that leisure activities vary substantially with respect to perceived levels of risk, and that perceived risk associated with leisure activities appeared to contain two major dimensions. The first dimension was associated with financial, psychological, social, satisfaction, and time components of perceived risk. The second dimension was associated with functional and physical components of perceived risk. Cheron and Ritchie also concluded that perceived risk appeared to diminish as individuals became more familiar with and more interested in a particular leisure activity. They found that this concept and its associated measures aided the understanding of other relevant theories and models.

Perceptions held by the public toward the amount of risk inherent in recreational activities which determined the contribution that various components of risk made to an individual's perceived risk was examined by Brannon, Condello, Stuckum, Vissers, and Priest (1992). One hundred fifty four

shoppers (55% female and 50% married) with an average age of 30.4 years, one child, at least a high school diploma and earning an average annual salary of \$30,000 were questioned from four Ontario malls during the month of December, 1990. The instrument was based on Cheron and Ritchie's (1982) survey and consisted of 12 recreational activities and 12 adventurous outdoor activities in which subjects reported the extent of their experience and the amount of overall risk perception they had for each activity. Seven components of perceived risk were considered for each activity: financial, physical, social, psychological, functional, time, and satisfactoriness risks. Subjects responded by placing a mark on a continuous line between the extremes of low and high risk for each activity. A 9-point scale from low (0) to high (8) was used to obtain scores by measuring the position of the mark. Results of the study indicated that the general public tended to perceive outdoor pursuits as being quite risky with the physical and psychological components of perceived risk being the most common and best predictors of overall perception of risk. Brannon, Condello, Stuckum, Vissers, and Priest concluded that activities appeared less risky to the public which had greater experience.

The effect of stress inoculation training on the level of anxiety experienced just prior to abseiling from the roof of a 70 foot building were examined by Mace and Carroll (1985). Stress inoculation was defined as the sequential application of stress self-management skills. Forty undergraduate physical education students volunteered for the study and were administered statements from the Perceived Stress Index (Jacobs & Munz, 1968), the State Trait Anxiety Inventory (Spielberger, Gorsuch, and Lushene, 1970), and a Fear of Heights Index. Subjects had their anxiety levels tested three times prior to their abseil,

and an intensity score was derived from the word or phrase chosen by subjects from the Perceived Stress Index that best described their feelings. Subjects were 53% female between the ages of 18 and 23 years old. Mace and Carroll randomly assigned the subjects to one of four training conditions (stress inoculation training, self-instructions training, practical training at a low height, and no training). Subjects were asked to rate the fear that they had for each statement on a 7-point modified Likert scale; (1=no fear and 7=extremely terrified). A one-way analysis of variance was conducted on the responses from each of the tests administered prior to treatment. The results clearly revealed the effectiveness of stress inoculation training as a means for controlling anxiety. The group that received this training had the lowest scores on each of the three dependent measures. Mace and Carroll suggested that their data pointed to a significant change in actual affective experience which resulted from the stress inoculation procedure. Subjects reported less anxiety and distress and appeared less discomforted prior to the second test abseil. The combination of self-instructions and practical training at low heights was especially effective in combating stress and anxiety. Mace and Carroll's study was similar to the studies conducted by Harrison and Feltz (1981) and Ziegler, Klinzing, and Williamson (1982), which pointed to the potential of stress inoculation for ameliorating anxiety in sport. This article was effective in terms of research, but only covered a narrow age group which did not allow the results to be applied to older individuals.

Privette (1981b) initiated a research study that attempted to understand superior use of human potential. She defined peak performance as behaviour that exceeded one's predictable level of functioning, which represented

superior use of potential in any human endeavour. Subjects (n=120) completed a questionnaire consisting of a series of items and open-ended questions, and developed from the content analysis of narrative descriptions of peak performance and theoretical discussions of other positive human experiences in humanistic literature. Subjects narratively described their personal events of peak performance and completed the questionnaire relative to their superior experience. Subjects were 63% women and consisted of individuals who were members of four equal-sized groups (students in introductory psychology, students in creative arts, people enrolled in adult education, and people enrolled in counsellor education). Factor analyses with varimax rotation were conducted for peak performance and for averaged behaviour. Privette found nine factors: prior interest, trigger, clear focus, awareness, peak experience, intentionality, movement toward closure, spontaneity, and inner freedom. Results of the study indicated that the participants possessed potentials beyond those they normally used. Privette suggested that an individual was focused on the object of the experience, not on simultaneous irrelevant involvement from several others, activities or the desires of others. Privette concluded that in the moment of peak performance, the centred self encountered the object of focus in a dynamic interaction.

In summary of these four works, a critique and an examination of their relevance to this study was warranted. Cheron and Ritchie's study was quite useful in terms of understanding the eight various components of risk. The researcher examined perceived risk in this study; therefore this article was useful for understanding subjects' perceptions of risk.

Brannon, Condello, Stuckum, Vissers, and Priest's study was quite useful in

gaining follow up research based on Cheron and Ritchie's earlier study. The former article was helpful in comparing the findings of their research to this study.

Mace and Carroll's study was used to examine the effects of stress on individuals engaged in risk activities and how they coped with stress. This particular study was useful in examining perceptions and proved helpful in understanding why individuals engaged in adventure activities.

Privette's study was vague in terms of methodology; however, it explored some real and deep understanding of the potential that humans possess. The model that acted as the foundation for her study attempted to examine the peak experiences that individuals had while engaged in sport and recreation. Since this study attempted to examine the experiences of people involved with adventure, her work was helpful in describing these types of experiences.

Literature Related to Transfer of Learning

Most experiential learning programs were founded on the belief that learning or behaviour change focussed on including direct experience in the processes of growth (AEE, 1994; Dewey, 1938). If individuals discover that they are capable of achieving challenges previously thought impossible, then they create a new attitude towards the way they conduct their life at home or at work. This association from an adventure experience to the corporate workplace is classified as transfer.

Gass (1985) stated that transfer is the positive or negative effects that a particular experience has on an individual's lifestyle and his/her future learning

experiences. If an individual recalls a learning element from a past experience and relates this element to a new learning environment, then transference (transfer) of learning has occurred. According to Gass (1993), adventure programs have the ability to create empowering experiences, often engaging participants in change that is difficult to reach without such interventions. Therefore, knowing how the transferring of individuals' learning and insights are gained during the adventure program into changes in their actual life situations is necessary. "This motivation, provided by the opportunity to use their learning again, can furnish one of the strongest incentives for our students' continued learning and the field's success" (Gass, 1990, p. 207). Gass (1985) identified three types of transfer: specific, non-specific, metaphoric. The difference among types related to what is learned, how learning commutes to the future, and how the two environments are linked.

According to Gass (1990), specific transfer allows a person to take precise learning and use it in exactly the same way in a very similar environment. For example, learning to type on typewriter keys works exactly the same way on a computer keyboard. Since learning environments are almost identical, transference is almost perfect. In non-specific transfer, a person takes generalised learning and uses it in a similar way in a very different environment. For example, learning to drive a car works in a similar way to flying an aeroplane. However, the learning environments are quite different and so transference is less than perfect. In metaphoric transfer, the learner perceives analogous connections which make two different environments appear similar. For example, if a learner could connect climbing a mountain with management by objectives (both one step at a time), then the

"nonspecificness" of the situational difference between environments could be reduced. As the two seemingly disparate environments become more specifically linked, transfer between the experiences increases accordingly.

The greater the number of linkages between environments, the more learning would inevitably be transferred. The combination of these linkages (called isomorphs--meaning same structure) creates a connecting metaphor, where both learning environments appear to be mirror images of one another (Priest & Gass, 1994). An employee who overcomes a fear of heights as a result of rock climbing has learned how to cope with one particular barrier. That employee could then transfer this coping strategy back at the office by recalling how he/she dealt with and conquered personal fears, applying the same approach at the office. This could only be accomplished if the parallels of rock climbing and office work could be brought to the employee's attention.

Gass, Goldman, and Priest (1992) examined how effective corporate adventure training programs are constructed. They stated that adventure programs "developed various skills such as decision making or communication skills; however, unless these skills had specific application to an organisations context and structure, the gains didn't transfer into improved performance" (p. 37). The purpose of corporate adventure training is to improve practises in a corporation through the usage of carefully structured adventure experiences. These experiences undertook the form of group initiatives, low and high rope course activities, or outdoor adventure activities such as rock climbing. Gass, Goldman, and Priest suggested that successful completion of these tasks required a variety of skills such as problem solving, leadership, decision making, innovative thinking, judgment, commitment, self-confidence, trust,

cooperation, communication, and conflict resolution. They concluded by stating that corporate adventure training was becoming established as a truly respected and evolved profession.

The rapidly growing area of experiential learning, and how it has been used in therapeutic adventure programs, was examined by Gass (1991). He explained how integration is achieved through a process of transferring an individual's learning and insights (obtained through an adventure program) into functional therapeutic changes in his/her real life. Enabling the employees to visualise a connection between the task at hand and other aspects of their lives, Gass concluded by outlining an important benefit of using isomorphic frameworks in therapeutic adventure experiences is that change occurs primarily during the actual activity rather than the debriefing session after the activity. The experience of behaviour change during an activity enhances the transfer of learning for individuals who express difficulty in verbalising their growth. Positive growth and change can be accomplished by methods that are used to address the specific needs of the individuals rather than through traditional therapeutic adventure experiences.

Transfer problems in corporate adventure training programs and how to overcome them were examined by McGraw (1992). A large number of organisations use corporate adventure training; however, some barriers hinder the transfer of learning back to the workplace. McGraw found six problems associated with corporate adventure training programs: inadequate organisation analysis prior to the program, problems related to corporate culture, lack of senior management support, lack of motivation among participants, mismatch between program skills and workplace problems, and

inadequate reinforcement mechanisms in the workplace. Results of his examination concluded that without changes in the culture of the organisations to make them more supportive of the general philosophy of corporate adventure training programs, there would be a high probability that individuals would have problems, and that the transfer of learning from the program to the organisation would be impeded. Corporate adventure training programs could be more effective if greater consideration were given to the organisational characteristics and circumstances of the client. McGraw stated that for these programs to have a lasting impact on participant organisations and individuals, a thorough prior consultation with the client organisation had to be undertaken.

Many adventure educators realise the importance of transferring the experiences back to the office. Individuals involved in corporate adventure programs learn by doing challenging activities by themselves or with others, reviewing what had taken place, and summarising what was learned and applying this to another learning environments. The learning which occurs as a result of an adventure experience ought to be applicable, relevant, understandable, and memorable to that individual (Stepstone, 1989). Roy Yamahiro (cited in Gall, 1987) stated that adventure learning allows individuals to translate the challenges that they encounter into their whole attitude about how they approach, their lives, and their jobs in general. Long (1987) stated that individuals engaged in corporate adventure training learn directly from the actual experience by reflecting on the process and end result of the experience.

In summary of transfer and its related topics, the article written by Gass, Goldman, and Priest provided some clear understanding toward the potential that corporate adventure training has towards organisations. It supported

experiences like rock climbing as having educational value for people. Gass's article provided some insight toward the concept of transfer and how it applies to various situations in the corporate workplace. The article written by McGraw overviewed the barriers that subjects in this study might have encountered in transferring their learning, and it suggested some strategies for overcoming these concerns.

Literature Related to Quantitative Methodologies

This study employed quantitative methodologies which measured the effects that an adventure experience had on individuals' behaviours and attitudes. This section reviewed studies with similar quantitative methodologies, especially those concerned with the instrument used in this study: the Dimensions of Adventure Experience (DAE).

Priest (1992) conducted a study that performed a pair of factor analyses on the responses of first-year and second-year subjects engaged in a ropes course experience in order to explore and confirm factor structure of this instrument. He administered the DAE to 209 beginner class and 24 advanced class university students for the study with the sets of dimensions related to perceived risk and to perceived competence rising with variance proportions of 59% and 67% respectively. The DAE consisted of a semantic differential of twenty-four bipolar adjectives concerned with perceptual changes in risk and competence which occurred from participating in adventure experiences. The survey had 12 adjective pairs which addressed the adventure dimension of risk (such as dangerous-safe or harmless-harmful) and 12 pairs addressing

competence (like skilled-unskilled or vulnerable-invincible). Subjects were asked to mark an X along a continuous line separating paired adjectives at the point which best represented their perceptions. Subjects were further asked to report their overall perception of the risks inherent in their chosen activity and their overall perception of their personal competence which dealt with those risks on a scale from 0 (low) to 10 (high). Subjects were 68% male, ranging in age from 17 to 22.

Priest found that the degree of challenge provided by an adventure experience depended upon the intermix of risk and competence levels of the individual. His analyses found three factors related to risk and two for competence. The first factor for risk was termed Fear of Risk and contained items related to harm, danger, hazard, and exposure. The second factor was Eustress and contained items related to excitement, positivity, stimulation, and challenge. The third factor was Distress and contained items related to tension, uncertainty, threat, difficulty, and negativity. The first factor for competence was Attitudes and contained items related to capability, confidence, boldness, success, invincibility, superiority, strength, and mastery. The second factor was Abilities and contained items related to experience, expertise, skill, and proficiency. All factor analyses employed principal component analysis as the factoring procedure (Eigen value > 1.0) and orthotran/varimax rotation as the transformation method (loading coefficient > 0.4). The results of the study provided support for the theory that as a result of participating in adventure experiences, individuals decreased their perceptions of the situational risks, increased their perceptions of personal competence, and moved toward astuteness: where their perceptions were in line with reality.

The changes in perceived risk and perceived competence resulting from participation in a chosen activity were investigated by Priest and Carpenter (1994). They administered the DAE to 100 university students during the winter of 1989. Subjects were categorised into four groups based on their chosen activities; these groups consisted of outdoor (n=27), nonphysical (n=18), novelty (n=19), and solo (n=20). Analysis of variance was conducted seeking interactions or differences between pre- and post-measures. Results of this study concluded that participants changed their perception of risk and competence due to the involvement in an adventure experience. Subjects within all four categories (outdoor, nonphysical, novelty, and solo) demonstrated the ability to make sound judgments regarding perceptions of competence and risk prior to and following their recreational adventure experience. Priest and Carpenter found that recreationalists reevaluated their adventure experiences based on personal competence levels and recent experiences.

Changes in perceived risk and competence among novice white water paddlers was examined by Priest and Bunting (1993) and confirmed the components of risk and competence associated with this activity were the same with earlier studies. They administered the DAE to 25 university students six times (before and after the trip, and twice either side of two rapids). Subjects were then asked to report personal feelings relative to their individual adventure experiences. Factor structures for this study were almost identical to the factor structures found by Priest (1992). A multivariate analysis of variance was conducted using Fisher tests as post hoc analyses, which scanned for differences among the five DAE factor scores (fear, eustress, distress, attitudes,

and abilities) across the six measurement times. Results of the study concluded that subjects related how they had initially overestimated the risks and underestimated their competence to handle the challenges. Priest and Bunting found that perceived competence increased for the novice paddlers due to their ability to become accustomed to the rapids as the canoe trip progressed. Qualitatively, subjects commented that they had enjoyed the trip, were anxious before the rapids, became more relaxed over time, improving their ability to paddle white water. Quantitatively, their perceived risk decreased while their perceived competence increased. Changes were caused by the subjects' diminishing fears and enhanced abilities. Changes in eustress, distress, and attitudes were less pronounced.

These three studies used the same DAE instrument used in this study. Priest's study was important because it established the validity, reliability, and factor structure for an instrument which measured risk and competence. He recommended the DAE as a valuable tool for gaining an increased understanding of the significance of adventure experiences and their impact on outdoor recreation participants. Priest's and Carpenter's study was beneficial because it confirmed validity and reliability for the DAE and demonstrated how individuals reevaluated their experiences and how this changed their perceptions of risk and competence. Priest and Bunting's study was adequate in its methodologies as it confirmed the factor structure of the DAE. In combination, these three works made a nice foundation for the quantitative methodology of this study.

Literature Related to Qualitative Methodologies

This study also utilised qualitative methodologies which measured the learning that individuals gained as a result of being engaged in rock climbing. Rowley (1992) suggested that qualitative research offered outdoor adventure educators another important way to substantiate and bring legitimacy to traditional claims, some of which could not be confirmed employing quantitative approaches.

A qualitative study that attempted to gain a better understanding of what led people to engage in rock climbing activity was conducted by Csikszentmihalyi and MacAloon (1975). They interviewed 30 rock climbers in Boulder, Colorado, Chicago, Illinois, and Devil's Lake, Wisconsin. These climbers were selected to provide a range of experience, involvement, and skill. Csikszentmihalyi and MacAloon asked for personal demographic information, present climbing habits, experience, and reasons for climbing. Subjects were 83% male, with an average age of 28, which ranged from ages 19 to 53. Their education levels ranged from high school equivalency to Ph.D. and their leading ability ranged from 5.3 to 5.11. Mean length of experience was five years of technical rock climbing and eight years of mountaineering. Subjects climbed at least two times a week in the summer and about once a week in the winter. Csikszentmihalyi and MacAloon used the interviews to extract the climbers' interpretation of their involvement in rock climbing. Directed questions were asked; however, the individuals were allowed to control the pace of the interview themselves. Results of the study concluded that rock

climbing had structural elements which produced intrinsically enjoyable experiences defined as flow. This state gives the climber a heightened sense of physical achievement, a feeling of harmony with the environment, trust in climbing companions, and clarity of purpose. Deep flow is an ecstatic experience which enables climbers to develop a heightened sense of mental state. Csikszentmihalyi and MacAloon found that the study of flow, which used rock climbing, had produced some concepts and methods for working more purposefully toward institutions that provides enjoyment and growth. A person who has attained this state of being inevitably compares it with the experiences of his/her actual life. Rock climbing engages a total involvement of mind and body that allows competence to be validated. The flow experience makes rock climbing worthwhile, despite the absence of materialistic rewards. Flow allows individuals to feel good about doing something, and this plays a role in the learning experience.

Klint and Priest (1992) conducted a qualitative study that examined the transfer of learning from a corporate adventure training program to that of a major manufacturing business workplace. During the month of November 1990, a one-day corporate adventure training program involved 11 male employees from a major manufacturing company. Their intent was to establish teamwork, trust, empowerment, communication, and working together with pride. Subjects were interviewed at three separate sessions that were determined by the company's schedule: the day of the treatment; four days after the session, and four months later. The interviews conducted examined immediate transfer and long-term transfer. Qualitative methodology was used to gather the feeling, emotions, values and personal thoughts of the subjects

involved in the study. Results of the study concluded that subjects experienced a positive connection between the corporate adventure program and the workplace as a result of the team building exercise that they shared. As a result of their experience, the company moved from a dysfunctional group to a group that was able to perform effectively, efficiently, and with a feeling of teamwork. Back at the workplace, the group increased trust among one another, performed more as a team, established effective communication, improved interactions, and shared roles and responsibilities.

The variety of learning and development experiences valued by managers, which looked for various common patterns for these experiences, was conducted by Greenaway (1995). One hundred managers were surveyed at the Brathay Hall Trust in Cumbria about experiences which had an influence on their learning and development during the years of 1988 and 1989. The results of these questionnaires were used as a basis for purposefully selecting eleven managers for interviews between two and six weeks after the course. Nine patterns were taken from the interviews with these managers: risk and support, involving experiences, transfer of learning and development, individual space, metaphor, resolving group issues, building on positives, identifying a problem, and opening up, coming alive. Greenaway suggested that many of these managers experienced "adventures in learning" as well as adventures from which they learned. These patterns provided educators with insight into the processes which most affected managers' learning and development while participating in a corporate adventure training program. The outcomes of this experience gave managers a more positive attitude towards work, greater awareness of their own resources and skills, feeling less threatened by change,

and having something to inspire further development such as a plan of action or a bond with fellow workers.

These three studies used the qualitative tools used in this study: the focused interview. The Csikszentmihalyi and MacAloon study provided a comprehension of what rock climbing meant to people and how it impacted their feelings; however, the information was two decades old. It is the only study found to use qualitative methods in research on rock climbing. The Klint and Priest study demonstrated how qualitative methodology was used to examine the impact of transfer in a corporate setting. The Greenaway study showed the variety of learning and powerful experiences that occurred in corporate adventure programming. His work had relevance to this research by pointing out some themes which were explored during interviews with subjects. In combination, these three works formed a blueprint for the qualitative methodology of this study.

Summary of Literature Review

This second chapter has provided a review of literature related to the benefits of rock climbing, research done on rock climbing, factors in the adventure experience, transference of learning, quantitative methodologies, and qualitative methodologies. These various topics composed the base content of this study: an examination of what was learned from the adventure experience of rock climbing and how that learning was used in the corporate workplace. The methodologies constituted the base format for answering these questions. Together, these all provided an overview to the extent to which

adventure programming influences learning opportunities such as changes in personal behaviours and attitudes.

CHAPTER THREE: METHODOLOGY

This study used both quantitative and qualitative methodologies. The primary focus was on the qualitative data, with the quantitative component serving as a means to assess the quality of the treatment. Furthermore, the quantitative part of the study acted as a springboard for the qualitative methodology. The research strategy for this study was a single group (n=75) nested pretest / post- test design with interviews as shown in the following notation (Issac & Michael, 1983):

$$T_1 - T_2 C_a T_3 - T_2 C_b T_3 - T_2 C_c T_3 \dots T_2 C_z T_3 - T_4 S - I,$$

where: T_1 = treatment pre-test, T_2 = climbing pre-test, C = a particular climb (with letters indicating different routes), T_3 = climbing posttest, T_4 = treatment post test, S = summary of learning, and I = interview.

During the treatment subjects were pretested on their expectations of climbing, and then they were pretested on their predictions before each climb and post tested on their performance after that climb. Once they had finished a variety of climbs for the day, they were posttested on their reflections from climbing. They also were asked to summarise their learning, its application to their work and what they intend to do differently in the future. An interview confirmed what they had learned and explored whether that learning had transferred to their jobs.

Research Paradigm

This study utilised a variety of quantitative and qualitative methods to

address its three purposes. The quantitative methods acted as a launching pad for the qualitative component by examining the factors affecting an adventure experience. The qualitative methods were largely used to interpret the learning and transfer that took place as a result of the adventure experience. Once again, the first purpose was to determine how learning was influenced by various factors in the rock climbing experience. The second purpose was to examine what people learned from the rock climbing experience. The third purpose was to investigate whether that learning transferred from the rock climbing experience to the subjects' real life in the workplace.

To determine how learning was influenced by various factors in the rock climbing experience, this study considered the following: competence, risk, climbing performance, attribution of success or failure (locus of control), the extrinsic responses of observers, the intrinsic feelings of the climber, motivation, self-efficacy, arousal and flow (these ten terms are discussed in the definition section). These factors were measured by a survey given during the treatment day. Parts of the survey were administered at the start and finish of the day and immediately before and after each climb. This determination helped explain what was learned and possible influences to learning.

To examine what people learned from the rock climbing experience, this study asked subjects to summarise their learning at the end of their rock climbing day. They were also asked how this learning might have applied to their jobs and what they intended to do differently when they returned to work. These qualitative written and videotaped comments were analysed for patterns of key phrases that demonstrated a trend of learning in a particular theme.

To investigate whether the learning transferred from rock climbing to the

workplace, a follow-up interview was conducted to discover examples of how the learning had been maintained back on the job. The tape recorded and transcribed data from these interviews were analysed for evidence that demonstrated learning had indeed transferred from rock climbing to work.

Sample

The sample used for this study was a group of 90 employees from a financial corporation in the Niagara Region. Subjects volunteered to participate in this study and represented a convenient and approximate stratification of different management levels and genders within the organisation. Subjects were shown a videotape of their roles in the study and gave informed consent prior to their participation. They also signed a waiver of claims against the researcher's university and the rock climbing facility (this is a standard procedure in adventure programming). All subjects were surveyed throughout a one-day treatment, then 10 subjects were purposefully selected for an interview by a quick telephone inquiry and follow-up call. Criteria for selection were based on interesting indications given over the telephone and extreme responses from the quantitative data. The sample of ten provided a broad spectrum of opinions and experiences.

Instrumentation

Instrumentation for this study was both quantitative and qualitative. The quantitative survey booklet and interview questioning protocol were appended.

The quantitative instrument had four parts: expecting, predicting, performing, reflecting. The expecting part (administered before the treatment day) asked subjects to provide their expectations of the risk inherent in rock climbing and their personal competence to rock climb. The predicting part (administered before a particular climb) asked for their predictions of risk and competence, and for their self-efficacy predictions about how far they would get up a climb or how certain they were about completing different sections of the climb. The performing part (administered after each climb) asked subjects again for their performance of risk and competence, and for their descriptions of feelings, causes, and evaluations of success or failure in their own minds. The reflecting part (administered after the treatment day) asked them to provide their reflections of the risk inherent in rock climbing and their personal competence to rock climbing, one last time.

The expecting and reflecting parts were taken from the Dimensions of Adventure Experience (DAE) survey. The DAE was a modified semantic differential with 26 scales. The first 12 bipolar adjective pairs addressed risky aspects of the adventure experience (such as safe versus dangerous or easy versus difficult). The second 12 bipolar adjective pairs surmised personal competence (such as confident versus hesitant or superior versus inferior). The last two scales considered the subject's overall perception of risk and competence. Responses for all 26 scales were made by placing a mark (X) along a continuous visual analogue line and scores were measured by a ruler (Priest, 1992). The DAE had content and face validity, test-retest reliability (with 0.93 coefficient of stability), and established and confirmed factor structures (Priest & Carpenter, 1994). The 12 scales associated with risk had three stable

factors: fear, eustress and distress. The 12 scales associated with competence had two stable factors: abilities and attitudes. Both factor analyses employed principal component extraction (Eigen values > 1.0) and orthotran/varimax rotation (loading coefficients > 0.4).

The qualitative instruments were of three types: video tape recordings, written comments, and audio tape recorded interviews. A video camera was used to record comments made by subjects whilst engaged in rock climbing and during a reflective debriefing session which normally followed the treatment day. At the end of the day, subjects wrote down their feelings, perceptions, and learnings in order to answer some of the final survey questions. These written comments and excerpts from the video recordings formed the foundation needed in determining what was learned from the rock climbing experience. This learning summary also formed a starting point for the qualitative interviews with subjects a month after their treatment day. The information gathered from the quantitative component of the study served as a starting point to getting at the learning and transfer that has occurred. The interviews were conducted at the corporation and questions were asked regarding: their overall thoughts about the adventure experience; the learning that had occurred as a result of the adventure experience; and the transfer of learning that had occurred from rock climbing to the corporate workplace. These tape recorded interviews transcribed the amount of transfer carried over from the adventure experience to the workplace, and identified the presence of any helping or hindering forces associated with transfer.

Procedure

The procedure for data collection had several phases: preparation, treatment and interview. In the preparation phase, subjects were briefed on their roles for the treatment day. They watched a video tape on what to wear, how to climb, and when to fill out surveys and they completed obligatory paperwork (consent forms and waivers of claims).

In the treatment phase, subjects were briefed on safety procedures and outfitted for their day with a harness and helmet for rock climbing. Subjects were given a booklet consisting of the four- part survey instrument. During the day they attempted (and finished) several climbs of varying difficulty. Before and after each climb they completed a predicting and performing part of the survey booklet, and at the start and end of their treatment day they also completed an expecting and reflecting (DAE) part of their booklets. Subjects were debriefed in a group discussion that focused on learning. This debrief was videotaped and guided by an expert facilitator. The purpose of the debrief was to fulfil an ethical responsibility of adventure programming (should people reflect on experience) and to encourage subjects to start thinking about their learning. With these thoughts fresh in their minds, subjects filled out a final page in their booklets and answered questions about what they had learned, how it might have applied to their work, and what they planned to do differently in the future.

In the interview phase, the researcher visited 10 subjects who had been purposefully selected based on interesting indications and extremes from the quantitative data. The interviews, held at their workplace, were audio tape

recorded and lasted between 30 and 40 minutes. After reviewing the subjects' written comments (made at the end of the rock climbing treatment day), the researcher proceeded to ask questions regarding their overall thoughts about the adventure experience, the amount of learning that had occurred as a result of the adventure experience, and the degree to which that learning had transferred from rock climbing to the corporate workplace. These interview questions were appended.

Ethics approval was given by the human subjects' subcommittee of the Brock University Senate in February, 1995. Rock climbing treatment days took place during the first two weeks in March, 1995. Interviews were conducted during April, 1995.

Limitations of Methodology

Clarity of questions in a survey would limit this study. Therefore, questions were written as clearly as possible and the survey was pilot tested with a small sub-sample of similar origin to the subject sample. Furthermore, the researcher and several assistants were present during the surveying for the purpose of answering any questions the subjects had about how to fill out their surveys. Consistency of assistants varied over the two-week testing period while conducting the same measures or performing the same instructional task.

The repeated use of two similar questions on all tests (rating risk and competence) could have caused a testing effect. Subjects may have gotten used to these questions and over time responded quickly and without taking the time to think about their answers. Also, during debriefing and interviewing,

subjects may have given the socially acceptable answer that they thought the researcher wanted to hear. However, experienced facilitators were able to identify such comments and probed for examples with deeper questions.

Subject's learning may have been focused and emphasized by the survey and interview aspects of testing. Thus the intrusion of instrumentation may have caused greater learning in some cases. Thus this testing becomes like a debriefing by helping people to revisit and think more about their learning.

Data Analysis

Quantitative analysis of data took place using StatView software packages for Macintosh. Factor analyses were used to confirm the factor structures of data from the DAE components of the survey. Analysis of Variance and matched t-tests were used to seek differences between subjects' responses taken before and after each climb as well as before and after their treatment day.

Qualitative analysis of data took place using Nudist software packages for Macintosh. Follow-up to this analysis included member checks and the use of a "Devil's Advocate" (the researcher's supervisor) to corroborate the data content and its interpretations. The outcomes of these follow-up procedures allowed the researcher to identify what was learned from rock climbing and whether that learning transferred to work.

CHAPTER FOUR: RESULTS

This study had three purposes: to determine how learning can be influenced by various factors in a rock climbing experience, to examine what people can learn from that experience, and to investigate whether their learning would transfer from the rock climbing to the subjects' real life in the workplace. Climbing in an indoor rock climbing gym constituted the half day treatment for this study. Quantitative and qualitative methodologies were used to achieve this study's purposes. Subjects were administered the DAE survey immediately before and immediately after the treatment. They also were contacted by phone three weeks after the treatment. A purposefully selected group of subjects from these phone contacts were personally interviewed by the researcher one month after the treatment. This chapter presented the quantitative and qualitative results of the study divided into several sections: return rate, DAE, changes in perceptions, treatment effectiveness, what was learned from rock climbing, and what transferred to work.

Return Rate

The study began with ninety subjects voluntarily participating in the treatment; seventy-five actively participated; only seventy-one subjects' (95%) answers and responses were used in the data. The four discarded surveys were from subjects who left a majority of items unresponded and who may have answered many questions in what could only be described as a trite and frivolous manner.

Subjects consisted of 32 males (45%) and 39 females (55%), with an

average age of 31 years. Only two subjects had ever climbed before with the remaining 69 experiencing this kind of risk for the first time. Subjects held various positions in this corporation such as managers, telephone operators, customer services, shipping, and secretarial staff. Subjects took the treatment in ten different groups over a ten-day span and could not be randomly assigned because of their work commitments. Fifty-three subjects (71%) were contacted by phone for a quick selection interview, and ten (13%) of these participated in an in-depth 30- to 40-minute interview with the researcher discussing what they experienced, what they learned, and how their experience and learning were applied to their jobs.

Dimensions of the Adventure Experience

The 12 risk and 12 competence bipolar adjective pairs of the Dimensions of the Adventure Experience (DAE) were subjected to separate Factor Analyses. As in Priest's (1992) study and as with Priest and Bunting (1993), this study found three factors for risk and two for competence as shown in Tables 1 and 2. These confirmations lend additional credibility to the quantitative data.

The factor termed "Fear of risk" for this study contained three of the four items found in Priest's "Fear of risk" factor with one other that did not load in the earlier study (danger, tension, threat, and hazard). The "risk Eustress" factor contained two of the four items associated with Priest's "risk Eustress" factor with one other item that did not load in the previous study (excitement, easy, positivity). The last factor, "risk Distress", for risk from this study contained one of the five items found in Priest's "risk Distress" factor with two others that did

Table 1: Factor Structure for the 12 Bipolar Adjective Pairs Related to Risk (n=71)

Risk Item	Fear	Eustress	Distress	Commonality
Threat	.793			.656
Tension	.712			.618
Hazard	.621			.654
Danger	.577			.548
Excitement		.746		.603
Positivity		.699		.597
Easy		.685		.482
Challenge		-.691		.485
Stimulating		-.656		.496
Uncertainty			.838	.724
Exposure			.700	.587
Harmful			.637	.577
Eigenvalues	3.490	2.326	1.211	
Variance Prop.	29.1%	19.4%	10.1%	
Cumulative Var.	29.1%	48.5%	58.6%	

Table 2: Factor Structure for the 12 Bipolar Adjective Pairs Related to Competence (n=71)

Competence Item	Attitudes	Abilities	Commonality
Capability	.888		.799
Strength	.765		.636
Success	.750		.565
Invincibility	.504		.499
Superiority	-.758		.659
Confidence	-.693		.549
Proficiency	-.652		.519
Experience		.825	.723
Mastery		.617	.653
Boldness		.593	.360
Expertise		-.831	.722
Skilled		-.754	.690
Eigenvalues	5.560	1.814	
Variance Prop.	46.3%	15.1%	
Cumulative Var.	46.3%	61.4%	

not load in the earlier study (uncertainty, exposure, and harmful). For perceived competence, the first factor labelled "Attitudes" for this study contained four of the eight items found in Priest's "Attitudes" factor (capability, success, invincibility, strength). The second factor, labelled "Abilities", for this study contained two of the four factors found in Priest's "Abilities" factor with two others that were not found in the earlier study (boldness, experience, expertise, and mastery). Many of these common items were even found in the same order with similar loading coefficient strengths. The outcomes of this study fit with the findings of Priest's earlier research which indicated that subjects involved in adventure experiences, such as rock climbing, experienced a decreased perception of situational risks, an increased perception of personal competence, and moved toward astuteness, where their perceptions were in line with reality. These factor comparisons are summarised in Table 3 and those items which consistently load on the same factor for all four studies are highlighted in bold. The lack of consistent loadings for the distress factor may be partly explained by the lack of distress present for subjects. They were climbing in a controlled indoor environment to a height of only seven meters. At no time did anyone appear distressed, as is commonly the case for climbers on an outdoor rock face.

Changes in Perceptions

Seventy-one subjects participated in a total of 365 climbs for an average of 5.14 climbs/per person. Subjects' perceptions of climbing changed as the day progressed as shown in Table 4.

Table 3: Factor structures for the DAE from past studies

<u>STUDY</u>	<u>FEAR</u>	<u>EUSTRESS</u>	<u>DISTRESS</u>	<u>ATTITUDES</u>	<u>ABILITIES</u>
Priest's Explor- ation (1992)	Potential Harm Danger Hazard Exposure	Excitement Positivity Stimulation Challenge	Tension Uncertainty Threat Difficulty	Capability Confidence Boldness Success Invincibility Superiority Strength Mastery	Experience Expertise Skill Proficiency
Priest's Confirm- ation (1992)	Potential Harm Exposure Danger Hazard	Excitement Challenge Stimulation Tension Positivity	Uncertainty Threat Difficulty	Success Confidence Boldness Invincibility	Expertise Skill Mastery Proficiency Experience Strength Capability Superiority
Priest & Bunting: White Water Canoe. (1993)	Exposure Uncertainty Potential Harm Danger Hazard	Excitement Positivity Challenge	Threat Stimulation Tension Difficulty	Success Capability Invincibility Superiority Confidence Mastery	Experience Expertise Skill Proficiency Boldness Strength
This Study: Rock Climb. (1995)	Threat Tension Hazard Danger	Excitement Positivity Challenge Difficulty Stimulating	Uncertainty Exposure Potential Harm	Capability Strength Superiority Success Confidence Proficiency Invincibility	Expertise Experience Skill Mastery Boldness

Table 4: t-test outcomes with pre- and post means (with standard deviations) for the DAE associated with significant changes in risk and competence items.

Significant Item	Pre-mean (S.D.)	Post mean (S.D.)	CHANGE	Probability
<u>Risk Items</u>				
Dangerous-Safe	6.427 (2.610)	8.111 (1.971)	+1.684	.0001
Boring-Exciting	8.283 (1.484)	8.656 (1.174)	-0.373	.0162
Challenge-Unchall	1.066 (0.992)	0.761 (0.911)	+0.305	.0271
Easy-Difficult	7.231 (1.629)	7.842 (1.517)	-0.611	.0083
Harmless-Harmful	3.290 (2.030)	2.615 (1.883)	+0.675	.0183
Hazardous-Secure	6.592 (2.369)	7.520 (1.920)	-0.928	.0024
<u>Competence Items</u>				
Unskilled-Skilled	3.086 (2.669)	3.745 (2.315)	-0.659	.0453
Novice-Expert	1.636 (1.629)	2.236 (1.764)	-0.600	.0228
Proficient-Deficient	4.343 (2.144)	5.071 (2.138)	-0.728	.0067
Experience-Unpract	7.297 (2.284)	6.687 (2.354)	+0.610	.0344
Weak-Strong	4.834 (2.314)	4.045 (2.459)	+0.789	.0040
Failure-Success	6.967 (1.739)	6.297 (1.852)	+0.670	.0227
Superior-Inferior	3.859 (1.703)	4.556 (1.830)	-0.697	.0063
Masterful-Untalent	4.686 (2.057)	5.134 (1.732)	-0.448	.0414

Subjects changed several of their perceptions related to risk and competence during their climbing experiences. Regarding risk, they felt safer, more secure and less harmed after the treatment than before. They also found their experience to have greater excitement, challenge and difficulty than expected. Feelings of safeness and security probably occurred once the subjects were educated with the various safety equipment used in the sport of climbing. Much of the anxiety felt by individuals was diminished after their first climb: once they realised the rope would hold a fall and the safety systems were effective. Subjects indicated that they felt more at ease as the day progressed. Watching someone else fall off of a climb reinforced that the equipment would keep them safe.

Conversely, subjects also realised how exhilarating climbing was as they participated in a wide range of easy to difficult climbs. They found that climbing was a challenging sport, especially when climbing on routes that were the hardest. Many of the subjects made comments before the treatment that it looked easy; however, once they were engaged in the activity itself, this perception soon changed. Many of the subjects lacked the upper body strength, muscle stamina, movement technique, and problem-solving ability necessary to climb with grace and ease. Hence, most found the climbs more and more difficult, as they tired toward the end of the day.

Regarding competence, subjects gained skill, expertise and experience from their climbing. On the other hand, they also shifted their perceptions toward being less proficient, strong, successful, superior, and masterful across the treatment.

Increased skill, expertise and experience were likely attributed to the fact

that they had the opportunity to practice their technique and increase the confidence in their ability to climb throughout the treatment period. They also had the chance to observe others and learn from their technique and mistakes.

Contrary to this, subjects lost proficiency, strength, success, superiority, and mastery as the day wore on. Completing approximately five climbs each was beyond the endurance limit of all but the fittest subjects. Hence, many reported feeling “burned-out” and exhausted by the end of the day. Lacking the qualities and characteristics of a top climber seemed to intensify feelings of inadequacy on the more difficult routes. As a result, subjects failed more often in their attempts during the latter part of the treatment than they did in their earlier moments. Most subjects were highly motivated employees and created high expectations for themselves. This motivation diminished over time as their abilities did not “come up to scratch” against their expectations.

Subjects’ overall perceptions of risk and competence were evenly matched throughout their participation in rock climbing. Subjects’ perceptions had mean scores of 46.626 for risk and 48.549 for competence before the treatment, and mean scores of 42.154 for risk and 50.529 for competence after their day of rock climbing. Therefore, they were affectively engaged in a condition of peak adventure (Martin & Priest, 1986) during the treatment because their values of perceived risk and competence were relatively equal and balanced.

Treatment Effectiveness

In summary of these findings, the treatment appears to have been effective. On the average, subjects experienced fear, eustress, but not distress, and they

applied their abilities and attitudes to the task at hand. They also changed some of their perceptions of risk and competence variables, but maintained their overall levels in a condition of peak adventure where risk and competence were balanced.

Subjects' expectations were also evenly matched with actual performance. They predicted successfully reaching an average of 5.5 meters (on the 7-meter climbing wall), and their true average height attained was observed by facilitators to have been 5.3 meters (no significant difference). Expectations, height reached, and accuracies for highest point on the 365 climbs are summarised in Table 5.

Accuracies greater than 1.0 indicate more people reached the top of the climb than expected to and were probably surprised to do so well. This suggests that about half the climbs (49%) were positive achievements, and at least this many were deemed successful climbing experiences.

All of this tells us that the rock climbing day had a notable impact on subjects: It changed their thinking, but did it change learning or behaviour? The qualitative data answer these questions.

What Was Learned from Rock Climbing?

The first half of the qualitative data were concerned with what subjects learned from rock climbing. These data were accumulated from transcription of video tape recordings from the debrief and written responses to open-ended survey questions. Both of these sources were obtained from subjects on the day of treatment.

Table 5: Expectations for Highest Point climbed (N=365)

Height Intervals	Subjects who expected to climb this high (X)		Subjects who actually climbed this high (O)		Accuracy (O÷X)
7 metres	n=144	(39%)	n=178	(49%)	1.236
6 metres	n=189	(52%)	n=211	(58%)	1.117
5 metres	n=263	(72%)	n=246	(67%)	0.935
4 metres	n=325	(89%)	n=287	(79%)	0.883
3 metres	n=349	(96%)	n=308	(84%)	0.883
2 metres	n=357	(98%)	n=339	(93%)	0.950
1 metre	n=360	(99%)	n=355	(97%)	0.986
0 metres	n=365	(100%)	n=361	(99%)	0.989

At first, 15 distinct themes emerged from the data and were labelled by the researcher (on the basis of common wording and in no particular order) as: trust, determination and motivation, patience, planning, strategies, teamwork, perception and expectation, goals, limitations, concentration, confidence, learning from failure, support and feedback, skills, and taking risks or challenges. However, once the researcher evaluated the data in greater detail, he realised that many of these themes had common content and so some of these were collapsed into ten distinct learning themes.

The themes of inspiration, determination and motivation were combined. Preparation was constructed by combining three previous themes: planning, strategies, and patience. The third theme was labelled goals and limitations as a combination of these two previous themes. The fourth theme was labelled perceptions and expectations which consisted of the earlier perception and expectation themes. Five other themes remained similar: confidence and risk (challenge) taking, trust and support, teamwork, feedback and encouragement, and learning from failure. Skills and flow represented leftover topics. These ten learning themes are discussed in the remainder of this section. To accurately express and describe the data, original quotes from subjects are interspersed with the researcher's brief interpretation of the data. Some quotes are composites and are created by combining the statements of several subjects who said very similar things. The presentation of data from learning and transfer is followed by thematic discussion.

1) This first theme of inspiration, motivation, and determination was created from several other key words such as effort, achievement, discouraged, and persistence:

I just wanted to get to the top, or to keep going and just look at the next notch. I was just trying to get to that one and then just take one step at a time,... but after it was there, like one thing mattered to me, it was like my next step or whatever. So...I learned that maybe I am more determined than I thought I was to get to the top, or get to a certain point and be happy that I got there. Determination was the biggest thing to show that I really wanted to get up there.... I needed determination on climb #3, I was almost going to quit but I hung in there and made it. I made all of them except the last one, and I tried and tried and tried and I couldn't, so I learned, I guess, that you have to have determination in order to succeed.

Subjects were inspired to try rock climbing and had to be motivated and determined to persist with their efforts to achieve. They also learned a great deal about being discouraged, having a positive mental attitude, and learning from others:

I learned not to get discouraged. It was the first time, so not to get discouraged, just have fun and keep trying and learn...things are achievable if you give it some effort even though sometimes you think you can't achieve what you are facing. You give it some thought, some hard work and sometimes it's achievable. Don't give in...be more persistent...try again if [at first] you don't succeed...keep trying and sooner or later things will work

out...not to let failure let me down ,but to go on and try again...[and] not to give up so quickly

I learned that you could get really motivated just by watching other people. You can learn from watching others and it can help you succeed...put down 100% and if you can't do it just keep trying. You have to see in your mind exactly what you are going to do and then go ahead and do it. Success doesn't come easy, you always have to try harder. Believing that you can achieve will help you achieve. I can do whatever it is if I set my mind to do it [if I] don't give up, keep trying.

Participants were more motivated and determined after their experience with the climbing wall because they realised that rock climbing was a difficult activity and without personal inspiration they would not succeed.

2) The second theme of preparation was created from three previous themes (planning, strategy, and patience) and by considering additional key words: prepare, analyse, conclude, and one step at a time:

I learned that sometimes I like to take on things that are harder rather than gradually work my way up. I'm too impatient, I want to try difficult things but without planning first. Some of the challenges that I took looked easy but they were not. So I made assumptions that I could do that, no problem, and I didn't plan very well in advance and wasn't able to compensate that crux point as

well as I could have. When you looked at [the wall], you thought it was easy but once you started going it was harder and you didn't have a plan. So where I am going to go next and you're not sure. Once you are already up there and trying to figure out a plan, it is too late because you start to get tired and your arms burn out.

Subjects described their learning about preparation and its potential application to work:

I learned that you have to take one step at a time. You can't jump right to a hard one...sometimes you have to swallow your pride and go back to the basics if you jump too far ahead and you can't do one. I found that it is better to tackle the tough ones first before you get tired because if you start to burn your energy on the easy ones first, you won't have any chance of doing the harder ones later. [On the job you] do your most challenging work first in regards to a project. If you look at the whole wall you might be intimidated to get to the top. Whereas if you take it one handhold at a time it's not so difficult. Same at work if you break it down into smaller parts it will seem more attainable.

You have to plan ahead of time before you climb...there were surprises that you encountered along the way and had to react or you feared that you couldn't get by at certain points. [At work] you have to plan before you begin things, but there will always be times when you will only find out what you are in for when you are

into it. Here, for example, when you look at how you are going to do it then when you get up there and see the size of some of those holds are then you have to rethink your plan and be willing to make changes to the plan when required.... The key thing is that it takes a lot of planning and strength to achieve your climb. You had to evaluate the climb critically in the beginning. [At work] you needed to search for that one best way to complete a task. There may be more than one way to do it. But one will be more efficient and more effective. You need to be open to suggestions and ideas.

Applies to my job because trying your very best at everything you do is a success; planning your projects one step at a time will help you to achieve your goal. Have to work things through at a comfortable pace by not rushing into anything or over reacting [and] patience is needed in succeeding an aim or a goal...it allows you to get around a difficult situation. I learned.I need to plan and be prepared mentally and physically for something like rock climbing, and this can be mirrored to almost everything in life...It's a matter of wanting to get there and planning on how to get there. The planning and trying to succeed are important.

A lot of what I was doing wrong on the wall was much like what caused me problems at work, for example lack of planning and reaching for the top too soon. I learned the value of planning

before you attack the wall. You have to know what you are going to do. One wrong move was often the reason that you didn't get to the top of the wall, so you have to plan ahead. I need to plan out a strategy more [at work] as to how I am going to do something. Take my time and figure out what I'm going to do before I get going.

They pledged to do things differently back at the office:

I will certainly do it again, and prepare myself a little more ahead of time, and to take that back to the workplace. Any task I have, I will plan my strategy a little more and not just assume this is an easy project and not plan for it properly.

I will analyse things [around the office] more carefully before I tackle them. So that I won't get in over my head. Look at it from different angles.

I will learn to take things as they come and cope with them with the best of my ability...don't always think about what is on top, but what is in the middle...not be so quick to bite someone's head off...not jump to conclusions with a customer, plan a strategy on how to handle a customer...my weak area is making snap conclusions without obtaining all the information.

Take things one step at a time and gain successes in smaller

chunks rather than trying to get one big success story all at once...relate to my customers by overcoming problems with them, and using different avenues for that...develop easier ways to do things...plan on the strategy on how to handle a customer... look for additional ways around problems

3) The third theme of goals and limitations was created from four key words such as goals, limitations, strengths, and weaknesses:

I learned that goals are attainable even if you have to learn different avenues, new education, or new skills at least if you want to do something, you can learn to do it. Even if you don't have the skills in that one day, you may have to work on it or just go about it in a different way. You set a goal that can be reached and sometimes you set a goal, [and] it's out of your league. Probably because you are out of practice or out of shape; but if you practice you can reach your goals. Sometimes you overdo it, but you realise you know where you have to start from, what you need to achieve, and what strengths and weaknesses you have to build on to accomplish your goals.

I learned that anything is attainable if you plan and be realistic about your goals. I will set my goals at work so that they are more attainable. Maybe smaller goals that I can reach. So that when I reach that I can say "yes I got that" and move on to the next one.

Not to have a large goal, [because] that takes forever to obtain. If you set smaller goals, it gives you that high when you achieve it, [and you can use that] to help motivate you to achieve your next goal.

I learned there were pure physical limits to what you can do...I became painfully aware that I have limitations. I tried a number of different [climbs] and found my limits, I can work from there. I realised that there are certain limitations to your job [and that] you need skills because you are limited in what you know each day.

I learned that no matter how much heart you have you have physical limitations.... I have to accept my limitations and try to eliminate my weaknesses. To accept where I am an expert and work to become an expert in other areas where I am now more limited. To realise there are certain limitations to your job...when assessing my deadline/results and those of others...be realistic.

I will focus on improving my weaknesses rather than improving my strengths, because my weaknesses are what inhibit me and increasing my strengths will not make me better. I will be more focused on what my goals are and what I have to do to achieve them, what I need to do to succeed. I [also] need to remember that limitations change. You have to factor that in with individuals and situations. Yes, that person may be able to do this today, but not

in other situations...In a sense, there are limitations and you learn very quickly out there.

I learned you have to know your limitations. At first I started trying to go further than I should have and thought I should have got to the top and didn't. So then I went back and tried the easy ones; but it affected my confidence and then I only thought then maybe I could get halfway up. Trying the hard ones right away ruined your confidence for the rest of the day. [Its all] about understanding your limitations..don't bite off more than you can chew!

4) The theme of goals and limitations was also linked to the next theme of perceptions and expectations according to learning expressed by subjects above. The fourth theme was created from key words such as easy, difficult, hard, deceiving, judge, high, expect, and perceive. This was the distilled essence of perceptions and expectations for a large number of subjects:

Rock climbing is not as easy as it looks!

As inferred by the quantitative data, subjects changed several of their perceptions as a result of their experience identifying strengths and weaknesses. Several other subjects echoed the simple comment from above:

I learned things are not always what they seem to be. Once you get there, things can [also] be deceiving. Just because the walls have a lot of holds,... well, they are difficult to grip.

I learned that you can't really judge something just by looking at it until you really try it; sometimes it may be easier or harder than you thought but you don't know until you try.

I learned it was a lot harder than it appeared. When I came in I thought I could get to the end, no problem, but once we started it was really hard and I couldn't do all of them...I set my expectations way too high for my physical abilities.

I learned [that I held] high expectations for myself. By trying one wall and saying "Hey this is not so bad" and then jumped to the top. But I couldn't jump that many levels and [still] do it.

I learned that sometimes your perception of a challenge isn't what it turns out to be once you start to tackle it. Some things looked pretty straight forward and easy, but once you started to use whatever it was you were using to accomplish your goals, it just wasn't enough.

The whole experience was new to me so everything I learned was new to me. But I found there were challenges for everybody...a lot were harder than I thought, but also the reverse that some that I thought were hard were easier than they looked. You never know what is going to be there until you try it.

Many subjects attributed their learning about perceptions and expectations to their lack of muscular strength necessary to be an outstanding climber. This sentiment was echoed by a dozen or more subjects:

I found out I am not as strong as I thought. I thought I had more upper body strength. I need to get myself into better condition both mentally and physically and then I could do better. I knew I wouldn't do very well but I did a lot better than I thought in a way but I would like to get in better physical condition at least.

However, a contrary opinion was expressed by one subject:

I was stronger than I thought, I didn't think I would get to the top, but I did. I learned you have to learn the basics first, before you can go on to the harder ones.

As a result of their learning about perceptions and expectations, they were committed to changing things back at the office:

I will never take anything or anyone for granted or make assumptions that a situation or task will be very easy to handle. I will be open-minded in that my perceptions of how an individual sees something, there is no right or wrong.

5) The confidence and risk taking theme was created from key words such

as self, confidence, courage, risk, fear, challenge and put down:

I found I learned more about myself and my confidence and self-esteem in looking at what I was able to do today. I gained more confidence after doing this. I didn't expect to do any of them, because I have a terrible fear of heights. And just making it to the top gave me confidence....I found the courage to try something new and to try harder things.

Subjects learned about the importance of this fifth theme:

I've learned that you can obtain your goals by having a lot of confidence in yourself...it will help me be more confident [by] allowing me not to be afraid of taking a challenge. My ability to take on challenges and to do my best...leaves me with a positive outlook for the future. Know your limits, but take a challenge and push yourself a little harder and see if you can't succeed the next time. Don't lose confidence if you don't always succeed. You can do it. Anything is possible.

They gained confidence, or discovered confidence they did not know about, from their rock climbing experience:

I learned that I have a little more inner confidence. That I gained more confidence as I went along. I began at an easy level and

moved up. I started off not expecting to make it to the top on any of them. After I made it to the top of the first one I became more confident.

This new-found confidence allowed them to take greater risks:

I learned that I enjoy taking a risk and going into a new situation. Trying something that I've never done before. Not simply for the accomplishment. I like the actual process of enjoying each step. The thought process that might be involved in the new experience.

I [also] learned that you have to take risks but you also have to know where your limitations are and take on calculated risks that you think you have a chance of achieving and not just driving into something. Everything is a learning experience and you have to be willing to learn and take certain risks for what you want to accomplish.

Successfully taking greater risks permitted them to gain more confidence, especially those who tended to be somewhat insecure:

I can do my job only if I would give myself a little more confidence because I tend to put myself down too much. I won't put myself down, but rather build myself up...when looking for [opportunities],

having more confidence in myself...[and] have confidence in others. I will continue to think positive and tackle challenges optimistically.

As a result of greater confidence, they pledged to be different at work:

I will continue to attempt challenges before me that I'm not natural at, and try not to be afraid to try something new. But I realise and accept that you might not be good at them and work with that. I will continue to gain more confidence with each challenge that I come upon and also to encourage people more, my co-workers giving them more confidence too.

I would have more confidence training someone. I have difficulty training someone to know my job and thinking that they can do it as well as I can. I would have more confidence in relating to them and getting across to them what I want to get across to them.

6) The sixth theme developed was trust and support. This theme emerged from key words like trust, support, security, and helping:

I reinforced that I have a great deal of faith and trust in others. I have a great fear of heights, but...I never thought of the height. I trusted the people...so much, [that] the fear of heights never came into play. The support, knowing somebody is there for you

holding on to you. Like somebody said, if nobody was there, no way would I try to get even half way up those walls. Just knowing that there is someone there gives you the security that if you fall you are not going anywhere. I think we are finding that more and more at work as well. There is always someone willing to help you when you have difficulty.

The importance of trust and support was obvious to most subjects:

It is a lot [of] trust and responsibility. You need to trust the other person. You can't do it alone, you need the other person to make it successful. You have a tremendous responsibility to not let the other person fall. I'm terrified of heights and it made me nervous to be up there with my partner on the other end of the rope at the bottom. It built a lot of trust between the two of us. At first, I wasn't very confident that my partner would be able to lower me down properly without letting me fall to the ground. Then as the day went on I built up that trust that she would not let me fall when she lowered me. When your partner gives you support it helps to enhance your performance. It gives you that little extra.

Today reinforced my belief in the participative style. I mean you help each other out. I get satisfaction out of helping other people accomplish their goals just as much as I get satisfaction of accomplishing my own goals. I feel like I am part of that, helping

out and giving support; and that is what we did here. Helping out, giving support and encouragement. It's nice to know someone is there to help you out along the way if something happens at work. That they're there to back you up in case you fall.

I learned that everybody is willing to help each other and help everyone to achieve their individual goals. Putting your trust in others is not so easy, but [this] makes it possible to achieve greater goals. As I learned to trust people, it became easier to achieve goals. Like at work when you trust your co-workers, it is easier to do your job and you can do it better.

7) The seventh theme of teamwork was developed from key words like team, group, and together:

I would say that greater things are achievable as a group or a team effort. As soon as you have one person that isn't willing to participate or doesn't get along with others it can cause friction and hold other people back. So to get along with other people is motivational, and [with] teamwork you can do a lot more things together and go further than by yourself.

Several subjects linked teamwork to a number of other themes:

The teamwork is definitely what gets you up a climb. Having

everyone down there encouraging you really helped [and] having your partner down below. The camaraderie was great and helped you get to the top. Without the teamwork, you couldn't have done it. I knew if I couldn't make it, the two below me would help.

Working together and teamwork is important. Not any one person knows the best way to do something. There are a lot of alternatives and some are better than others so you need to be open to suggestions...if everyone works together, it can help to get things done. Teamwork can get you a long way...if a task becomes larger than expectations and you don't have the experience, bring someone on board who has.

The employees at work work better as a team than as individuals, [and] the work goes a lot smoother. You respect each other, and you trust one another. By trusting one another you know that they can do their job and it will help you do your job. You have to work as a team to get good results at the end.

We were all going through the same thing. Having the same feelings of success and failure and maybe not expressing it the same as everybody else. I guess it sort of makes you feel a part of the team. If you make it with the support of others, it makes you feel you accomplished it, as part of a team. Teamwork is an asset.... As it applies to my job, if we don't work together , [then]

we won't get the job done in the amount of time we have.

Teamwork is important, you need to depend on others and they need to depend on you. Trying to solve problems together will make things easier at work. You can achieve a lot more at work by working together when you learn a new job or simply in your everyday tasks.

8) The eighth theme was labelled feedback and encouragement from these two key words and additional ones like communication, advice, help, cheering, and camaraderie:

I found that after not making it to the top and when you come back down having someone say you did well, that was good to hear after not making it. Some encouragement, some positive feedback, is really good for the person receiving it. [It's] very helpful because it makes you want to keep going and keep trying. It's nice to know that if you try you're not sure you can do it, nobody's going to cut you up or make fun of you or put you down or make you feel bad.

Subjects remarked on the importance of depending on others in rock climbing and at work:

Your partner helps coach you when you have trouble. They encouragement you and give advice on how to do things.

Communicating ideas as to how to get around a difficult situation is very important. It helped to have him cheer me on, it gives me the added support that I need to help reach the top...positive feedback helps. The encouragement to keep going and keep trying can help you succeed.

I learned that it's okay to ask for help, or rely on someone sometimes, because other people may be able to see other ways of getting around the obstacle in your path at work. If you see someone having a hard time you shouldn't condemn them, because you have been put in that place as well. So you should encourage the person. I will provide more encouragement to my co-workers.

Positive feedback and performance evaluations are important.... I believe the communication is very important. All of the above help to make work that much more successful and enjoyable. Positive feedback is important to give people confidence to try harder and to keep trying. A support group will give you confidence...so you have someone you can call if you need help. Giving encouragement and positive feedback will help others to gain confidence.

The encouragement, the camaraderie, that everybody is out there cheering for you when you are up there and it really helps when

you are up there. [Its] good to know people are cheering for you. I find that usually I am pretty shy and at the beginning, we were saying, "Come on you can do it". But by the end, we were hooting and hollering, when the person got by the part they were having trouble with. Everybody was giving each other encouragement and support when they were climbing.

It's good to have a group that has different perspectives on things. That way you can bond as one and help each other and then you get the encouragement and everything from it. With us it's got to do with communication and from that communication you can give support...when you're climbing you can hear the other people and the support. It gives you that much more incentive to reach your goals. I think we were very supportive at the end.

The encouragement from the others and watching the others do it first. I was really petrified at the beginning thinking that I couldn't do it. But when I saw the others doing it, I said "I am going to try as well" and I think that's why I kept going on it. If I was the first to go, I don't think I would have done it. But watching others made me want to try and think that I could do it.

9) The ninth and most commonly reported theme was learning from failure. It was constructed from the single key word of fail:

One thing I've learned is that success in this case isn't just

necessarily reaching the top. Success is measured in various degrees and you can be quite happy with your achievements, even though you didn't reach the top. Not getting to the top isn't always a failure, sometimes just trying something can be its own success. It's what comes out of the failure. It's not the failure itself but the things that come out of it along the way. The fact that there may have been a different way of doing it. Learning that makes you a better person and will help me to achieve [more] down the road. I learned that there are lessons and successes in failure.

Learning from failure was mentioned by numerous subjects:

Failure is a learning experience, you learn more about yourself, and how far you can take things, and so I think it's positive.

I learned not to consider myself as a failure just because I didn't reach the top but rather consider myself as not a quitter and consider that I gave it my best try.

I learned that failure is not always bad, and that you can learn from them. If I fail it will still be a success to some degree on some level.

I've learned that it is okay to fail, but still keep that positive attitude...learning failure is part of success.

I realise there are no failures, just smaller successes.

They saw the value in failing and gave themselves permission to do so on the job:

I will allow myself to fail knowing that I will be able to learn something from that failure.

Even if we don't reach our goal we are learning things along the way. So I think that today or the next time I will not think, "What if I fail", but "What will I learn along the way?" I won't be so afraid to fail and I will learn from what I am doing.

Not to take any failure as bad but as a way to learn to do better...I will take the things I have learned here and apply them at my place of work to help bring a little order to my job. I will look at projects and life one rock at a time. That should get me where I want to go; but if I don't, I will not feel bad. I will still feel like I succeeded to some degree and did not simply fail. I won't feel so bad when I don't reach my goal [and will] take failure and use it as a tool to build and create more confidence to take on a different projects.

10) Finally, a few interesting comments appeared to be "left over" in that these did not fit easily into any of the other themes. Since there were more than one data point, these comments were not ignored. The two minor themes of

skill and flow were included for completion. At least five subjects saw skills as their major lesson:

We all had different capabilities and tried different things. We could all do things differently to different levels. I learned we all had different capabilities.

Basically I need some more skills and to practice those skills in order to complete what I want to do.

I think it's skill sets that you have to continually be willing to learn new skill sets...I realised I would have to work a lot harder at this if I was going to be any good. You have to practice and learn the proper skills.

You have to learn the appropriate skills to be able to do something. So when you first try you have to try not to get frustrated or mad, if you can't do it right away. It may seem hard or confusing at first but if you keep trying it will get easier and you will be able to do it eventually.

I will get involved in work related events, volunteer and take on more complex projects... learn more specialised skills and make sure employees have skills needed. I will seek advice from someone who has experience or training.

Several subjects reported being in what could have been states of flow:

I was so focused on the problem [that] I couldn't hear her say anything, but once I relaxed and thought about it, I could hear everyone giving me advice from below.

In regards to the whole group, I didn't pay any attention to them.

When I was up there, it was our group and that was it.

I wasn't really thinking about anybody else [except] me. I think it was a pretty individual activity and what they were thinking of you at that moment didn't matter in my opinion anyway. I wasn't thinking about anyone else.

It was like I was concentrating on one spot, to get there, it was just do one at a time like not worry about the next guy.

Your whole being (body and mind) has to work together to be successful.

Climbing provided focus for these individuals which enabled them to initiate the strategies needed to succeed. If there were no focus, individuals would not have experienced a state of flow which provided good feelings among participants.

What Transferred to Work?

The second half of the qualitative data were concerned with what subjects transferred from rock climbing to the workplace. These data were sourced from transcription of audio tape recordings made during personal interviews conducted on the job one month after the treatment. Data were arranged by the same ten learning themes identified previously.

1) Subjects welcomed the break from their routine. They saw rock climbing as a means to re-energize and return to work inspired, motivated and determined:

Things like climbing excite me. It gets me really motivated and I wish we had more things like that at [the company], just to get you motivated like that.... Well, I talk to about two hundred people a day so there is a certain amount of frustration. You get all these complaining calls over the course of a day and it's nice to be able to vent that some way and something like that helps me to relax and motivates me and coming back to work, I then do a better job.

2) Subjects discussed how they were better prepared for their jobs now:

Now I plan more, make people aware of what I'm working on. I take more things in stride. Say something happens at work; I look at or analyse things before making a judgment call.

Instead of jumping into a project now, I prepare for it. I go back to the project and really plan it out beforehand or else I waste a lot of energy getting half way through it or half way up the wall. With both, if you can't see the path right to the end on your way, you are going to get stuck or lost.

Oh definitely... I had no idea of what rock climbing was and to struggle with it and then go away and think about it. I found myself doing things differently. It's not something I just left behind me as if was just a day off. I often wonder about climbing and wonder what would happen next time if I tried this strategy or that strategy. You continually think about it, because you don't usually fail at a lot of things. So you keep thinking about it.

Yes, a few projects, I would take one step at a time and any of the stuff that I could not do, then I would get help somewhere else. Everything I guess is one little step. It doesn't have to be one big jump and then you can manage better.

3) Subjects mentioned how the experience had given them a new way of looking at things, which helped them to identify their goals and limitations:

Most of it for me was working with people and teamwork. It made me open my eyes and not be so judgmental and having an open mind. The fact that I reached the roof there a few times really

made me feel a sense of accomplishment. The fact that I did do it and the fact that I was thinking positive the whole time, despite having my doubts, made me feel that yes I can do this. I have this positive outlook on life, because my goals are more attainable and my outlook on work is different because of that.

4) Many subjects related stories of changing their perceptions and expectations at work. These perceptions and expectations concerned others, themselves, relationships, and tasks:

The people that (sic) were there had the same fears that I did. For instance a manager, you perceive them to be way up there and they aren't necessarily way up there; they might have more qualifications and they are basically the same as you are and I think I learned not to put somebody higher as far as managers too high because they have fears and they feel the same way we feel. Just because they are afraid of the higher power. Now, I've learned to put myself level to them and be able to talk to them the same way as we are talking now.

Personally, myself, I have a low self-esteem and it made me better as a person. I'm always looking at myself as lower than everyone else and I was surprised, in one way, that I could do what I could do. To do what you did and you could always improve, but not if you were so hard on yourself.... I learned to change the way I

speak to my family. I try to work with them now; it's not always to prove a point. You try to do better and you are doing it for yourself and I think that was a big change for me.... Oh yes, It carries over and I learned what's important and what's not important in that respect and that's how it helped me.

The fact at being surprised. I'm better as far as opening my eyes to the fact that people may not have the same abilities as I think they do. It also reinforced my opinion of the value of teamwork and coaching and how important the learning and training is when you are going into something new. There is an advantage, since no one in the company knows exactly how things are to be done in my new job.

Yes, we're all trying something new. I think with my co-workers here, I respect a lot of them here at work and I know they know their job very well, but I've never put myself at their level, and at the same sense, out of work. I find them very athletic and they do all kinds of athletic things and I feel they're above me and when I did this, I really didn't think I could do it, but I did and for a few of the climbs I felt I did more than [my co-workers]. Yes, actually I do. It's come up in conversation some days with people I went with and even people who went a different day. We talk about the experience, so it has bonded us when we talked about what we had learned. Now we have something in common.

5) These changing perceptions and expectations led to greater confidence and risk taking. A lot had to do with how people interacted at work:

I think it's made me a better person; it's opened my eyes a little more and there are things I can do which I thought I couldn't do. Just the experience with co-workers had made me more comfortable around some of them. For instance I'm not afraid to speak to a manager anymore. If I have a question or an answer I can go to them and feel comfortable about it. Before I wouldn't even leave a message for that manager because I would second guess myself as to whether or not it was written right.

Yes, because I think at work there's a professional air about things and this gave me the chance to get to know them on a more personal basis and that made me feel comfortable. As far as managers, I never gave my full opinion because I was afraid of being belittled and it's okay to give your opinion and make mistakes and not be so hard on yourself. Just take them off that pedestal and go one on one.

The diversity and challenges. Trying to find different climbs that day is like five different days here. Not that it's unpredictable, but it's always something new and challenging. I'm a slow learner, especially when it comes to talking to new people, and in this area I have to talk to new people. Trying the different challenges of

climbing is like calling these different people. I'm getting more confidence in that area; the more I do it, just like climbing, because you know what more to expect.

I'm more confident. I'll now take on bigger projects and I have more trust in my abilities. I gained more courage... It added a little more confidence back here at work to try different things.

The challenge itself. When you look at the challenge that was facing you, after you climbed several of them, you thought 'hey I need a lot of help here' so you got somebody that knows how to scale the wall. So back at work, we have these projects that we do and they always seem to be much bigger than we initially size them to be. At some point with the project cycle, you come to realise that you are under staffed and you don't have the stuff you need to accomplish it. So you need to ask for help, like "give me a couple more supplies or some people!" The realisation that you need somebody with rock climbing skill to help you along or [help you to] put your finger like this or like that.

Not everyone changed. At least one subject reported:

I learned that if I try things, I might be able to do them... I think in my job, because at times I'm not very confident in what I do, because everybody else around me seems to know so much and I

don't think I know as much as they do, so I'm afraid to stand up and take charge or do anything I should do, without okaying it with somebody else. So it's important for me, I guess, to try things, to do them, and to find out if I can.

6) Subjects found a new level of trust and support back at work. They noted that these were reciprocal:

I like to think of this company as being a bit different than other companies. Although people are ambitious and want to be promoted and so on, I think this company has learned to support other people to get ahead and when you support other people they will support you back. I'm now putting more of my trust in individuals, especially those who put me down the most. I know when to approach and when not to approach; and how not to approach them.

You have to trust your co-workers, like you do your belayers and the instructors telling you that this is how to use the equipment. On a personal level, if you are friends with these people, then you can confide in them. With rock climbing, at that moment it was your job to get up there. Just like at work, you have a job at hand and you have to do it. Just like rock climbing, work is doing the best that you can with what you have.

This had to be a very trusting environment because there is a lot of information that comes and goes and a lot of stuff happens. I think the more you do the more secure you become with it. I think it takes a while to build up trust, but it has increased a bit. The elaborate safety procedure that you go through and the time we spent just trying to hook ourselves up. You have to have a lot of confidence in your partner and that this individual would kind of encourage you and coax you and guide you and see things that you couldn't see. I am very outgoing whereas my belay partner was not. I enjoyed encouraging and coaching that person.

I started trusting people more. I have to trust my co-workers' decisions on particular things. I could probably use a lot of work on that because a lot of the time I will kind of second guess them. I find a stronger sense of teamwork in our department as a result of that particular day.

7) Teamwork was at the heart of many subjects' answers:

Teamwork has always been important in the things that I have done in the past. Here at [our company] teamwork is important and those are positive things.

This happens at work...that I can rise to a challenge and conquer it and do it together as a team. It helps break down barriers and

have people approach you now and say "hi". It makes you feel better, bonding. Makes work a lot easier.

I encourage more teamwork and more team effort. I talk up the value of team players and that people must work as a team member with me because I'm the coach, not their boss or their manager. I also am willing to take a risk and to push myself a little bit more.

8) The importance of giving feedback and encouragement among co-workers was noticed by almost everyone:

I brought that back to work as far as co-workers. Not to take things so seriously. If you are having problems with some[one], you work around it, and sometimes it's your choice of words. You may not think you are offending them, but you are. So I think you have to think twice before you say what you are going to say. Co-workers aren't family, but I think you have to treat them like family, treat them like you would treat others.

Now with co-workers, I ask for their opinion more on what they think the situation may be. I'm not afraid to ask them anymore. If they portray to you that they know it all, then I tend to pull back and not ask, but I started asking more questions and so on. So I could get the answer I need to go on to the next step.

You don't just do the easy things now. It's good to try the harder things even if you have to ask to help. I ask my co-workers for a lot of guidance and feedback and help. I'm still getting them to check the end product.

Having someone give you positive and negative feedback instead of being on my back. Because you work with so many people you're bound to get into conflict and I try to concentrate on the situation, not the person giving me flack. So you think "okay, there's a message here somewhere" and you focus on the message as opposed to how you feel about the person, because you're not going to work with a lot of people you like. If you just focus on the situation and you don't take it personally. You have to think of alternative routes or ways...to get that info.

I learned that if you were in [co-workers'] positions, you would be upset quite a few times as well, and you have to understand that people may not understand things, that we just take for granted they do. You have to put yourself in someone else's shoes and then try to explain it in their terms. It makes you calm down as well. Basically, you just listen to them and use a calmer voice.

9) Learning from failure, given great attention during the treatment, carried over to the office:

I've been working on this whole project with a share group and we've been trying to bring those people together as a team and to get those managers to work together as a team. When we were talking to them about failure, that is something that they know nothing about and even if we do fail we've learned from it and will get it on the second time around. Like with climbing finding out how somebody got to the top or failed; with other companies we want to find out why they were successful or not and learn from that. Take a look at it first and picture where you are going to go. If you fall off don't give up and keep trying. Watching somebody else do it helped a lot as well... If they happen to fall you can see where they made their mistake so you don't make the same one.

Knowing that when looking at something, if it looks hard it is still good to try it, if I can't do it, well it's okay. I think if people don't fail things, then they aren't pushing themselves enough. If you are always succeeding, then big deal. If you don't push yourself, then you don't learn anything. You're never testing your limits or seeing what you are capable of. It's okay to be wrong, to realise you did wrong, and to go back and try to rectify the problem.

10) A few subjects saw the importance of gaining more skill at work:

I want a higher position eventually, so I think with education and know how, I have to learn a little more about the business and [get

some] skills. You have to approach the higher people as well and adapt to what they want. Now I'm taking courses and if I see something that comes around at work, I look at the necessary qualifications and actually try to get those skills. Even for myself, if I didn't have the qualifications, I'd still try them to let them know I'm interested, but now, in the future, I'll have a chance.

For your job skills you need to start at the bottom and I think that you have to learn the basics. First you have to listen to what they explain to you and also you have learn the skills. You have to start with the easy or not as hard a climb and just keep working your way up. You can try a big route every once and awhile, but don't get discouraged, if you don't make it. That's the way it is at work, you have to start at the bottom and work your way up to the top!

One person neatly summed up the entire experience and kept coming back to the metaphor of a work project being a lot like rock climbing:

I guess it's like doing a project. Each time you don't know what's difficult or what's not difficult, until you actually get into it. Once you get into it, you have to climb each step. I have to trust my partner and co-workers to do their [bit] 'till the project's done. Otherwise it might be kind of tough, but even if something is difficult it doesn't mean I can't do it. During the project, I can

always help others; but if you find you really can't do it, then someone else will be there to help you.

It's helped me at both work and at home. As far as rock climbing, it's okay to get attached, to work a little harder. Don't try to run from your problems basically. You have to get there one way or another. So just work with it and hope for the best.... Safety factor, make sure you have the right tools and the procedures to use those tools. Make sure you have the right people behind you to make you succeed. Make sure the challenge that is in front of you is not something that is beyond your reach. If you fail, get back up and try again. You have to have a lot of confidence in those around you. You have to look at what's available to you here. Let's say if you're doing a project and you don't have access to certain products, you have to ask for those products to be able to continue your work. So it's basically the same way; you have to judge and look at what's available to you. You can't be shy, you have to ask for what you need. I would say that I have.

We have this project that's due and based on what we had to do and the [stuff] supplied us, we couldn't do it. So, we had to justify additional head counts and I did that. I just knew...what I had to do...and I think that the rock climbing event probably played a role there, I think it's helped.

Discussion of the Ten Themes

As individuals gained more skill and experience in rock climbing, their motivations changed from extrinsic to intrinsic (Ewert, 1985; McIntyre, 1992). In this study, as subjects gained experience climbing, they began to be motivated for personal and social reasons. The criteria they chose to measure their success or failure against, as reported on their quantitative instruments, were categorised as: reach a goal (65%), perform to a standard (14%), overcome difficulty (8%), compare against others (5%), and attempt my best (8%). Clearly, the majority of these were external motivations as to be expected with novices. With experience, the researcher speculated that, with time, subjects would become more internally inspired as per his/her personal experience. Subjects found their increase in motivation was applicable to work. Some suggested that rock climbing provided them with increased vitality due to the novelty and recreation component. These were intrinsic forms of motivation.

Individuals are put into situations where they have to prepare for alternatives and get enough information to make good judgments on the task at hand (Stepstone, 1989). In this study, the rock climbing treatment provided subjects with a range of difficult routes which required planning strategies, solving problems, and reevaluating risk and competence in order for them to succeed. Climbers continuously decided which moves to combine into a synchronised action pattern of movement (Lefebvre, 1980). In this study, subjects developed patience as a consequence of their climbing experience. They were required to take things slowly, relax their mind and to think the problem through step by step. "The exploration and discovery of the best path was similar to the solving

of a mathematical problem...the successful search for good holds increased the certainty of reaching the top" (Lefebvre, 1980, p. 154).

Rock climbing was both physically and mentally demanding and required the establishment and fulfillment of personal and group goals (Iso-Ahola, La Verde, & Graefe, 1988). The development of these goals was only possible once an assessment of personal limitations was made. Many subjects did not understand the physical and mental demands that climbing required; therefore, some initially failed certain climbs because their goals were not set according to their abilities. Once subjects understood the various limitations they had, they set realistic goals which allowed them to build on their strengths and weaknesses. They became successful in later climbs and felt "more positive affect and less negative affect in situations that provide the resources to enable them to reach goals and satisfy needs" (Iso-Ahola, La Verde, & Graefe, 1988, p. 34). A few commented that rock climbing gave them a new perspective on life which allowed them to set attainable goals at work because of the better understanding of their various limitations on the job.

Subjects' perceptions changed drastically as a result of the physical demands of rock climbing. "The overwhelming rock wall initially creates in the climber the sensations of weakness and powerlessness" (Lefebvre, 1980, p. 154). However, they did not have the time or experience to perfect their skills, resulting in a weakened sense of physical ability. Many perceived the wall as being easy because of its height and number of holds that each climb had. However, they found that it was harder than expected since the size and slope of the holds were deceiving. People were uncertain about their competence to overcome the difficulty (or risk of not succeeding) and this could have caused a

feeling of stress and insecurity (Lefebvre, 1980). Subjects transferred the point that everyone is in the same boat once the adventure activity takes away hierarchical structures, labels, and positions. No one brought any special experience at rock climbing and so no one was an expert. This permitted them to gain a unique understanding of whom they were working with and to see them as another human being.

If people were provided an experience which involved risk and challenge, and were sure that they could not do it, but discovered that they could, then their realisation would translate into a new-found attitude, motivating them to access life and work in a whole new way (Gall, 1987). Rock climbing had subjects taking risks that they normally would not be taking at work. This enabled them to experience something new and to increase their levels of confidence. In fact, confidence was necessary to take risks in the first place. So risk taking and confidence appeared to have a transactional and causal relationship. Successful risk taking led to increased confidence, and vice versa, but unsuccessful risk taking led to decreased confidence, and vice versa. Rock climbing has been shown to enhance the specific perceived competence and self-esteem of individuals (Iso-Ahola, La Verde & Graefe, 1988). "Participants who risk physical and emotional vulnerability invest significantly and reap high returns in confidence and growth" (Long, 1987, p. 38). Many subjects commented that they were no longer afraid to ask for help, to question their bosses, and to try new challenges at work as a result of the climbing day. Climbing offered them the chance to challenge themselves, to increase their confidence without the pressures of work affecting their performance. Failure was allowed without penalty; this permitted subjects to experiment with more

difficultly, thus building up their confidence. This confidence was carried back to work, and subjects took new risks around the office.

As with any high risk activity, trust and support were necessary to ensure safety as well as physical, social, and emotional security. Subjects rose to the occasion and began trusting people whom they had only met on the morning of the rock climbing treatment. This increased trust resulted from taking responsibility for one another and remaining accountable to each other. Subjects realised that they needed to perform their respective roles during the climbing activity in order to ensure the safety of their co-workers. Success in corporate adventure training clearly depended on a team's ability to solve problems creatively, to allocate various resources effectively, maintain trust among members and to develop powerful support networks (Long, 1987). These programs are able to generate trust in a short period of time (Klint & Priest, 1992). On return to work, many subjects indicated that they increased their trust for co-workers, and that they would continue to do so more often. Others commented that a lot more support could be found around the office when projects were to be completed.

Teamwork is the number one aim of 90% of the North American corporate adventure training programs (Priest, Attarian & Schubert, 1993). Rock climbing developed teamwork and gave individuals the opportunity to bond with one another in a shared experience. Subjects were aware of the central importance of teamwork and had effectively connected it to most of the other nine themes, for both rock climbing and their jobs. As a result of their experiences, subjects realised that working together allowed for ideas to be shared and enabled more solutions to be generated. They transferred what

they had learned to work by providing evidence to take on any task with the help of others, by distributing the work among a large number of people, and by feeling a part of the group, rather than apart from it. The unification of co-workers, previously strangers and now friends, was clearly demonstrated by their comments about bonding in shared adversity.

Although rock climbing was presented as an individual sport, it provided opportunities to share ideas, give feedback and encourage others to succeed. Many subjects succeeded because of the help given by others. Without this assistance, many subjects failed to reach the top of their chosen climbs. They learned that feedback and encouragement helped others help themselves to succeed. As a result of the treatment, subjects claimed communication at the office had increased among those who had participated in rock climbing rather than those who had not. Feedback and encouragement opened up new avenues for shared ideas, constructive criticism and dealing with interpersonal conflicts in the workplace.

Learning from failure was the most impactful theme that emerged from this study. Experiential education was based on the philosophy of learning from one's mistakes, since these errors form the basis for future experience and learning (AEE, 1994). Subjects in this study welcomed failure as a positive gift of opportunity. Failure gave them the chance to learn a new way, to try again, to not repeat mistakes and to eventually become successful with hard work. As a result, they learned a lot about themselves and their co-workers from the failures they encountered. Their attitudes and opinions about failure appeared to have been shaped prior to the treatment day and may well have been an indication of healthy corporate culture: Failure on the job is not punished.

Like any performance situation, a variety of skills were necessary to be successful at climbing. Skills improved with practice and subjects slightly heightened their physical and psychological competence (Lefebvre, 1980). They realised that without the requisite skills, their performance suffered. They saw the direct correlation between this and project completion or promotion at work: "rock climbing the corporate ladder." A few subjects may also have experienced a state of flow during their climbing experience. The "careful matching of risk and competence in situations of progressing complexity... produces the experiences characteristic of the flow state" (Csikszentmihalyi & Csikszentmihalyi, 1991, p. 154). Indeed, flow theory was developed from interviews with a variety of groups including rock climbers (Csikszentmihalyi, 1975) who remarked that they focused their minds and bodies evenly on the task at hand. One subject also noted this balance.

Missing Learning and Transfer

Priest, Attarian and Schubert (1993) summarised the many benefits of a corporate adventure training program. They identified these as fitting into four categories: personal, group, cultural, and mixed.

Benefits to the individual included [personal] developments in self-confidence, leadership style, risk taking propensity, dealing with fear and stress, decision making, and personal inspiration and commitment (Williams, 1980; Beeby & Rathborn, 1982; Gahin & Chesteen, 1988). The work unit benefits from [group]

improvements in goal setting, team building, time management, conflict resolution, group problem solving, collaboration and cooperation (Creswick & Williams, 1979; Long, 1987; Kadel, 1988). Outcomes for the organisation involved [a cultural] enhancement of systems, structure, values and ethics, vision and mission, corporate climate, and motivational atmosphere, which results in the bottom line of increased productivity, decreased absenteeism and greater profits (Brathay Hall Trust, 1986; and Fleming, 1987). Lastly, an interaction of the other three developmental areas ([a mix of] cultural, personal and group) can lead to empowerment, trust and integrity, effective communication, environmental safety, judgment based on experience, and coping with change and uncertainty, as these benefits are shared among all aspects of the corporate organisation, individuals and work units (Mossman, 1982).(p. 12)

Many of these benefits were obtained from rock climbing, but several were not present in this study. Subjects did not explicitly comment about personal developments in leadership style or decision making. They did not mention group improvements in time management, conflict resolution or group problem solving. They did not express cultural enhancement of systems, structure, values and ethics, vision and mission, corporate climate, or the bottom line.

Benefits to the organisation were not directly discussed by subjects; however, they indirectly implied that the experience had made them more productive at work: the bottom line. The group benefits of time management and conflict resolution were never defined as a purpose of rock climbing,

although subjects did mention getting along better with some co-workers. Rock climbing did not provide the opportunity to improve time management since subjects were asked to climb as much or as little as they wanted to. It also did not create any conflict among subjects and so they did not need resolution. Although problem solving was necessary to rock climb, it was done by the individual and not the group. Although a supportive group may have offered ideas, the problem was always solved by the climber.

The researcher was surprised by the amount of group benefits that actually did accrue from an individually-oriented adventure activity like rock climbing. The lack of personal developments in leadership style and decision making were disappointing since these are the sorts of benefits that rock climbing should achieve. Perhaps leadership style, although an individual characteristic, needs the presence of a deliberate group dynamic or process to come into play. Leadership style was absent because leadership was never called for during the treatment. Decision making was indirectly addressed by subjects selecting their climbs based on risk and competence levels, through themes like perception and expectations, preparation, goals and limitations, and skills.

CHAPTER FIVE: CONCLUSIONS

Once again, this study had three purposes: to determine how learning can be influenced by various factors in a rock climbing experience, to examine what people can learn from that experience, and to investigate whether their learning would transfer from the rock climbing to the subjects' real life in the workplace. This chapter presents a summary of the results, creation of a model, conclusions, application of the outcomes, and recommendations for future research.

Summary of Results

Seventy-one subjects (32 males and 39 females), working for a Canadian financial corporation, participated in an effective treatment of a brief rock climbing experience held on an indoor climbing wall. Subjects were repeatedly surveyed with a valid and reliable instrument. Quantitative data analysis produced a credible factor structure and several significant changes in perceptions of risk and competence during the treatment. After a total of 365 climbs, and from their DAE responses, subjects felt safer, more secure, and less harmed, and found their experience to have greater excitement, challenge, and difficulty than when they first began. The same DAE responses showed that they gained skill, expertise and experience, and felt they had become less proficient, strong, successful, superior, and masterful from their experience. Positive changes were attributed to learning from experience, while negative shifts may have been due to the creation of astute perceptions over time.

Factor analysis of the DAE indicated that subjects experienced fear,

eustress, but not distress; they used their abilities and attitudes; they changed some of their risk and competence perceptions, but held their experience in a condition of peak adventure with balanced risk and competence. According to the qualitative data, subjects expectations matched their actual performance by climbing to the average heights they predicted prior to climbing. Achieving, and in some cases surpassing, their goals surprised them and undoubtedly contributed to their positive learning from adventure. Subjects learned a great deal from their rock climbing experience as discussed in their debriefing. Ten distinctive themes emerged from these qualitative data: inspiration, motivation, and determination; preparation; goals and limitations; perceptions and expectations; confidence and taking risks; trust and support; teamwork; feedback and encouragement; learning from failure; and skills and flow. Aspects of all ten learning themes transferred back to the workplace as suggested from the interviews. Subjects initiated behavioural changes as a result of their rock climbing experiences; while others had realised that their new learning could and should be applied to work, but they hadn't yet had the chance or found the time to make a difference. The results of this study suggested that subjects' learning was influenced by their ability to: take risks in a safe environment, fail without penalty, support each other, plan without time constraints, enjoy the company of fellow workers that they wouldn't normally associate with and participate in a debriefing discussion facilitated by an expert. These various factors influenced the subject's ability to learn from adventure. The debriefing discussions were particularly effective at getting people to share and reinforce their learning (as commented on by several subjects). Obviously, these outcomes are relevant for this case only and should

not be widely generalized beyond this study.

Creation of a Model

Figure 1 depicts a cyclic model of learning from an adventure experience like rock climbing. This is the researcher's interpretation drawn from connections within subjects' comments.

Notice that the model is a cycle of the ten themes discussed in the previous chapter. The thickly lined arrows represent a sequence of learning that subjects experienced when rock climbing. The thinly lined arrows represent interconnected themes, where subjects noted one piece of learning influenced another. The model begins and ends with the theme of preparation.

Subjects started their learning process by preparing for each climb. They received feedback and encouragement from co-workers in the form of watching the attempts of others, receiving personal coaching from a partner, and being cheered on by the group. The presence of feedback and encouragement creates an atmosphere of trust and support, and in turn, this fosters greater teamwork. With the feedback and encouragement, the atmosphere of trust and support, and the teamwork in place, subjects were ready to take risks. Taking risks led to increased confidence, which reciprocated a willingness to take more risks.

Subjects then developed their physical and mental skills to adapt to the changes in diversity of risks taken. On the occasional climb, they failed and as a result of this failure, they learned to try again, find a new way, and avoid

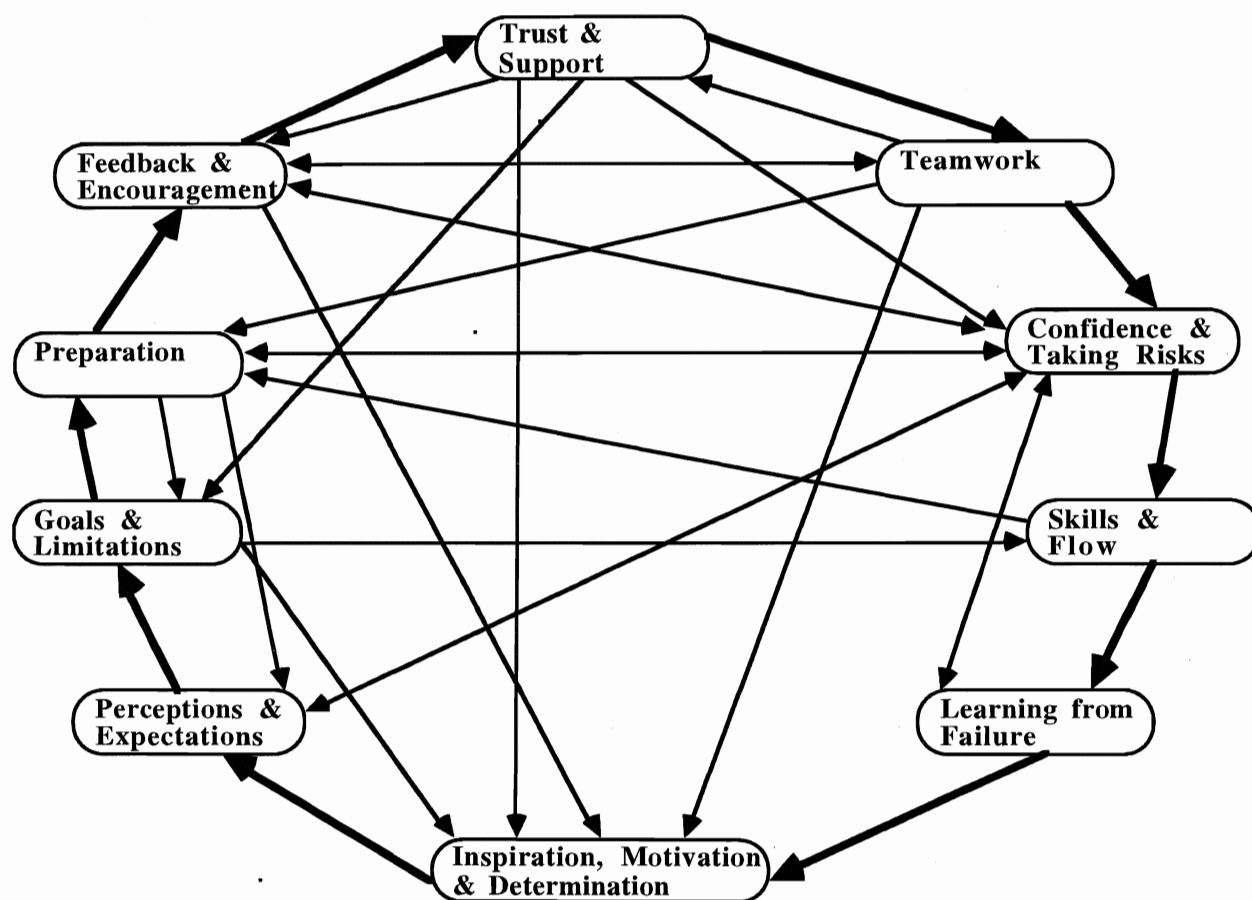


Figure 1: A model of the adventure learning process for rock climbing.

repeating mistakes. They eventually felt successful (whether they reached the top or not) and this caused them to be more inspired, motivated and determined than before. Their new state of mind changed their perceptions and expectations of their performance and allowed them to reevaluate their goals on the basis of new lower limitations or new higher abilities. Once goals were reconstructed, subjects had the opportunity to prepare for their next challenge and the cycle continued.

The themes of learning were connected with one another throughout the adventure learning experience. Some of these connections were reversals of the cyclic process. For example, the presence of teamwork brought greater trust and support, while the presence of trust and support led to greater feedback and encouragement. Subjects remarked that their level of preparation had an influence on their perceptions and expectations and on how they set goals based on their limitations. These themes also calibrated their levels of inspiration, motivation and determination.

Furthermore, the ability to take risks and gain confidence was cross-linked with almost every theme. The amount of trust and support or feedback and encouragement decided how far subjects were willing to "stick their necks out" in a challenge. How well prepared subjects were and what they perceived and expected to happen also determined the level of risk taking and how confident they were. Confidence and risk taking also was related to learning from failure and vice versa. Making mistakes might allow subjects to take lesser risks until their confidence returns.

Conclusions

In conclusion, this study has attempted to examine learning and its transfer from the activity of rock climbing to the corporate workplace. Subjects in this study learned a wide variety of "lessons" which could be grouped into ten themes. These ten themes, plus several other factors inherent in the adventure experience, refashioned their learning to fit their jobs in this instance. The culture of this particular corporation studied was likely a catalyst for this transfer. Subjects already valued elements such as teamwork and failure before they participated in the treatment. Their positive approach to this type of learning was likely to have been a key factor in their success for this study.

Application of Outcomes

This study aimed to strengthen the data base with its results. The adventure education profession has new information on learning from rock climbing. Previous research has examined motivations and benefits of rock climbing. This study looked more into examining the learning process and products.

This study aimed to generate data on the efficacy of corporate adventure training. The findings of this study suggest that a corporate adventure training program using rock climbing for an adventure training program could achieve beneficial change in its employees.

This study aimed to probe into the privacy of rock climbing experiences. Subjects talked at length about personal benefits from their experience. Although they talked about similar themes, no two people learned exactly the

same thing. Their experiences were personal and private.

This study used both quantitative and qualitative methods to examine the processes of learning. These methods complemented one another by giving two different perspectives on the topic of study. The researcher was not limited to only looking from one viewpoint; therefore he was able to see some things better with one approach and to see other things better with another.

The outcomes of this study may have prove beneficial for the experiential education profession and its practitioners. They can use rock climbing with confidence. Previously thought of as just a recreational pursuit, rock climbing was shown here to be a useful tool for educational and developmental programming.

This study also enabled practitioners to understand how and why rock climbing was useful in experiential and adventure education. The cyclic model proposed in this chapter was helpful in understanding the process of learning that took place and how the various themes were connected by subjects. This could permit practitioners to be more effective in their future instructional roles.

This study also allowed for school systems to see the relevance of introducing experiential education into the curriculum. For example, a typical school teacher might find the general factors of an adventure experience (such as risk taking, learning from failure, and facilitated debriefing discussions) to be worthwhile including or highlighting in classroom lessons.

Lastly, this topic is of great personal interest to the researcher. Although rock climbing is thought to be an individually-oriented adventure activity, the researcher was surprised to find a large number of group-oriented benefits and a few missing individual ones. These were likely due to the "levelling" effect of

making everyone appear equal in an activity where no one has prior competence or experience. This prevented a leader from emerging and meant the subjects had to pull together in a group-learning situation. Hence, no mention of leadership styles, but plenty of teamwork, trust, cooperation, communication, etc.

Recommendations for Future Research

The acquisition and transfer of experiential learning from rock climbing to the corporate workplace was determined in this study. Future directions for research should include different types of treatments such as white water rafting, sky diving, tall ship sailing, or caving and might provide similar or different outcomes worthy of comparison with this study. Longer treatment times should be considered. This treatment period was short and was less than the one- or two- day normal corporate program length. The longer the program, perhaps the stronger the influence and the greater the transfer and maintenance of new learning. In the future, instead of self-reporting by subject interview, observations from that employee's boss, co-workers, and customers could possibly provide a better measure of learning transfer. Long-term follow-up should be included in other studies. Priest and Lesperance (1993) have shown that most corporate adventure training can wear off in about six months unless reinforcement strategies were implemented. Therefore, a longitudinal design might provide insight into transfer barriers on the job.

If this study were to be repeated, a control group would ensure that changes were due to the treatment and not just aspects of intrusive research.

Furthermore, metaphoric forces were not identified in this study and therefore, these and other factors that may have enhanced or interfered with learning and transfer should be considered as a topic for further research.

Lastly, this study was conducted in a very controlled environment: an indoor rock climbing gymnasium. Future work should be done with rock climbing in a natural outdoor environment to see what might be learned. Higher cliffs (beyond the seven metres here) might allow for a heightened sense of risk, which might bring greater learning or “lessons” of a different kind.

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1. Before filling out any part of this booklet, please complete this page first.

RESEARCH STUDY

The **purposes** of this study are: 1) to examine the context of learning through rock climbing, 2) to determine what can be learned from rock climbing, and 3) to ascertain the extent to which this new learning will transfer to the corporate workplace.

Your **roles** in the study are: 1) to enjoy yourself, 2) to learn the new skill of rock climbing, 3) to learn some other things related to work, 4) to complete various pages in this booklet during the day of climbing, and 5) to be interviewed (at a later time & at the workplace) about your learning from this day.

Your **rights** as a research subject are: 1) to answer only the questions you wish, 2) to participate at your own discretion, and 3) to have your identity protected. Skip any question which you do not wish to answer, by simply leaving it blank and moving on to the next one. If you want to end your participation at any time, please feel free to do so without any penalty. Do not put your name anywhere in this booklet, other than your signature on this page (the page will be removed and kept separate from your answers). Responses will be reported as group averages and no names will be associated with individual responses. Your company will remain anonymous and your answers will be kept confidential.

I **agree to participate** in this research study. I understand the purposes of the study, my roles in the study, and my rights as a subject. I consent to:

please tick ☐ engage in rock climbing and its related activities (safety briefing, equipment dressing, knot typing, belaying, etc.)
any or all ☐ accurately answer the questions in this booklet (to the best of my ability)
that apply ☐ complete an interview about my learning (to be held later at my place of work)

(signature)

_____, 1995.
(date)

WAIVER OF CLAIMS

I am aware that by participating in rock climbing, I will be voluntarily exposing myself to physical and emotional dangers (such as damage to property, injury to myself, and even death). I acknowledge that staff will make reasonable efforts to teach me proper safety, but all dangers associated with rock climbing cannot be fully foreseen. I understand and assume those dangers and waive all claims or causes of action by me. I hold Brock University, its agents, officers, employees and volunteers harmless from any and all liability action, claims or damage of every kind and nature whatsoever arising from my participation. Furthermore, my signature below is also intended to bind my successors, heirs, representatives, administrators and assigns.

(signature)

_____, 1995.
(date)

Please show this completed page to your instructor before getting equipped for rock climbing.

To help you select the appropriate climb, routes are lettered according to their level of difficulty. Higher letters indicate more difficult climbs and lower letters indicate easier ones. Remember the letter of each climb you do, since writing these letters down in your booklet will often be necessary.

Please ask for help from the researcher if you are not sure how to answer any question.

2. Before you do any climbing, please complete this page.

Please indicate your expectations for climbing and for yourself by placing an 'X' on each line at the point that best represents where your opinion falls between the two extremes. Please assess each pair of adjectives independently and separately from the others.

I EXPECT ROCK CLIMBING TO BE...

Dangerous	_____	Safe
Definite	_____	Uncertain
Boring	_____	Exciting
Challenging	_____	Unchallenging
Easy	_____	Difficult
Protected	_____	Exposed
Harmless	_____	Harmful
Tense	_____	Relaxed
Threatening	_____	Comforting
Stimulating	_____	Calming
Negative	_____	Positive
Hazardous	_____	Secure

AS A CLIMBER, I EXPECT MYSELF TO BE...

Unskilled	_____	Skilled
Bold	_____	Anxious
a Novice	_____	an Expert
Proficient	_____	Deficient
Experienced	_____	Unpractised
Weak	_____	Strong
Confident	_____	Hesitant
a Failure	_____	a Success
Unable	_____	Capable
Superior	_____	Inferior
Masterful	_____	Untalented
Vulnerable	_____	Invincible

Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Please give your perceptions of the amount of **risk** inherent in rock climbing and for your personal **competence** at rock climbing before you climb:

Risk	_____
	None Low Medium High Extreme
Competence	_____

3. Please complete this page *BEFORE* your first climb.

A. What is the letter of this climb? _____

B. Examine the climb that you have selected. Look over the route carefully and anticipate what it will be like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

None	Low	Medium	High	Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

None	Low	Medium	High	Extreme

110114

D. For each of the blank spaces (to the right—>) please indicate how **confident** you are that you will reach that far up the climb. For example:

If you are totally confident you will get off the ground, put **100** in the lowest blank beside 0m.

If you are completely certain you will not get past half-way, put **0** in all the blanks above 4m.

If you are mostly sure you will reach the top, put **70** or **80** in the highest blank beside 7m. If you are mostly unsure, use **20** or **30**. If you think the odds are equal, write **50** in that blank.

Recognize that the numbers you enter will not increase as you move up the scale. Rather they will decrease, unless you are fully assured of reaching the top (then they will all equal 100).

Consider each level one at a time. Thanks.

	7m	6m	5m	4m	3m	2m	1m	0m
Roof	_____	_____	_____	_____	_____	_____	_____	_____
Half-way	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
Floor	_____	_____	_____	_____	_____	_____	_____	_____

Please proceed with your chosen climb and we hope you enjoy the experience!

4. Please complete this page **AFTER** your first climb.

A. What was the letter of this climb? _____

- B. Now that you have done this climb, look over the route carefully again and remember what the climb was like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

- C. Would you label your performance on this most recent climb as being sufficient or insufficient? ☐ SUFFICIENT ☐ INSUFFICIENT

- D. Using your own criteria for evaluation, was your climb a success or a failure? ☒ SUCCESS ☐ FAILURE

- E. What criteria did you use to evaluate your success or failure? _____

- F. What do you think were the causes of your success or failure? _____

- G. How did your success or failure make you feel? _____

- H. Has your climbing competence increased or decreased as a result of this climb? ☐ INCREASED ☐ DECREASED

- I. Next time, will you pick a climb with higher, lower, or the same risk? ☐ LOWER ☐ HIGHER ☐ THE SAME

A. What is the letter of this climb? _____

- None Low Medium High Extreme

None Low Medium High Extreme

_____ %	7m
_____ %	6m
_____ %	5m
_____ %	4m
_____ %	3m
_____ %	2m
_____ %	1m
_____ %	0m

Please proceed with your chosen climb and we hope you enjoy the experience!

4. Please complete this page *AFTER* your second climb.

A. What was the letter of this climb? _____

- B. Now that you have done this climb, look over the route carefully again and remember what the climb was like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

- C. Would you label your performance on this most recent climb as being sufficient or insufficient? ☐ SUFFICIENT ☐ INSUFFICIENT
- D. Using your own criteria for evaluation, was your climb a success or a failure? ☐ SUCCESS ☐ FAILURE

E. What criteria did you use to evaluate your success or failure? _____

F. What do you think were the causes of your success or failure? _____

G. How did your success or failure make you feel? _____

H. Has your climbing competence increased or decreased as a result of this climb? ☐ INCREASED ☐ DECREASED

I. Next time, will you pick a climb with higher, lower, or the same risk? ☐ LOWER ☐ HIGHER ☐ THE SAME

3. Please complete this page *BEFORE* your third climb.

A. What is the letter of this climb? _____

- B. Examine the climb that you have selected. Look over the route carefully and anticipate what it will be like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

330114

- D. For each of the blank spaces (to the right—>) please indicate how **confident** you are that you will reach that far up the climb. For example:

If you are totally confident you will get off the ground, put **100** in the lowest blank beside 0m.

If you are completely certain you will not get past half-way, put **0** in all the blanks above 4m.

If you are mostly sure you will reach the top, put **70** or **80** in the highest blank beside 7m. If you are mostly unsure, use **20** or **30**. If you think the odds are equal, write **50** in that blank.

Recognize that the numbers you enter will not increase as you move up the scale. Rather they will decrease, unless you are fully assured of reaching the top (then they will all equal 100).

Consider each level one at a time. Thanks.

Roof _____ 7m

 |

 |

 |

 |

 |

Half-way |

 |

 |

 |

 |

Floor _____ 0m

- C. For the vertical line (<— to the left), please indicate how far up the climb you believe you will get. Place an 'X' between the roof and floor at the **limit that you expect to reach:**

_____ % 7m

_____ % 6m

_____ % 5m

_____ % 4m

_____ % 3m

_____ % 2m

_____ % 1m

_____ % 0m

Please proceed with your chosen climb and we hope you enjoy the experience!

4. Please complete this page *AFTER* your third climb.

A. What was the letter of this climb? _____

- B. Now that you have done this climb, look over the route carefully again and remember what the climb was like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

- C. Would you label your performance on this most recent climb as being sufficient or insufficient? ☐ SUFFICIENT ☐ INSUFFICIENT

- D. Using your own criteria for evaluation, was your climb a success or a failure? ☐ SUCCESS ☐ FAILURE

- E. What criteria did you use to evaluate your success or failure? _____

- F. What do you think were the causes of your success or failure? _____

- G. How did your success or failure make you feel? _____

- H. Has your climbing competence increased or decreased as a result of this climb? ☐ INCREASED ☐ DECREASED

- I. Next time, will you pick a climb with higher, lower, or the same risk? ☐ LOWER ☐ HIGHER ☐ THE SAME

3. Please complete this page *BEFORE* your fourth climb.

A. What is the letter of this climb? _____

- B. Examine the climb that you have selected. Look over the route carefully and anticipate what it will be like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

440114

Roof _____ 7m

 |

 | 6m

 | 5m

 | 4m

Half-way | 3m

 | 2m

 | 1m

Floor _____ 0m

- C. For the vertical line (<— to the left), please indicate how far up the climb you believe you will get. Place an 'X' between the roof and floor at the **limit that you expect to reach**:

- D. For each of the blank spaces (to the right—>) please indicate how **confident** you are that you will reach that far up the climb. For example:

If you are totally confident you will get off the ground, put **100** in the lowest blank beside 0m.

If you are completely certain you will not get past half-way, put **0** in all the blanks above 4m.

If you are mostly sure you will reach the top, put **70** or **80** in the highest blank beside 7m. If you are mostly unsure, use **20** or **30**. If you think the odds are equal, write **50** in that blank.

Recognize that the numbers you enter will not increase as you move up the scale. Rather they will decrease, unless you are fully assured of reaching the top (then they will all equal 100).

Consider each level one at a time. Thanks.

_____ % 7m

_____ % 6m

_____ % 5m

_____ % 4m

_____ % 3m

_____ % 2m

_____ % 1m

_____ % 0m

Please proceed with your chosen climb and we hope you enjoy the experience!

4. Please complete this page *AFTER* your fourth climb.

A. What was the letter of this climb? _____

- B. Now that you have done this climb, look over the route carefully again and remember what the climb was like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

- C. Would you label your performance on this most recent climb as being sufficient or insufficient? ☐ SUFFICIENT ☐ INSUFFICIENT
- D. Using your own criteria for evaluation, was your climb a success or a failure? ☐ SUCCESS ☐ FAILURE

E. What criteria did you use to evaluate your success or failure? _____

F. What do you think were the causes of your success or failure? _____

G. How did your success or failure make you feel? _____

H. Has your climbing competence increased or decreased as a result of this climb? ☐ INCREASED ☐ DECREASED

I. Next time, will you pick a climb with higher, lower, or the same risk? ☐ LOWER ☐ HIGHER ☐ THE SAME

3. Please complete this page *BEFORE* your fifth climb.

A. What is the letter of this climb? _____

- B. Examine the climb that you have selected. Look over the route carefully and anticipate what it will be like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

None Low Medium High Extreme

550114

Roof _____ 7m

 | 6m

 | 5m

 | 4m

Half-way | 3m

 | 2m

 | 1m

Floor _____ 0m

- C. For the vertical line (<— to the left), please indicate how far up the climb you believe you will get. Place an 'X' between the roof and floor at the **limit** that you **expect to reach**:

- D. For each of the blank spaces (to the right—>) please indicate how **confident** you are that you will reach that far up the climb. For example:

If you are totally confident you will get off the ground, put **100** in the lowest blank beside 0m.

If you are completely certain you will not get past half-way, put **0** in all the blanks above 4m.

If you are mostly sure you will reach the top, put **70** or **80** in the highest blank beside 7m. If you are mostly unsure, use **20** or **30**. If you think the odds are equal, write **50** in that blank.

Recognize that the numbers you enter will not increase as you move up the scale. Rather they will decrease, unless you are fully assured of reaching the top (then they will all equal 100).

Consider each level one at a time. Thanks.

_____ %	7m
_____ %	6m
_____ %	5m
_____ %	4m
_____ %	3m
_____ %	2m
_____ %	1m
_____ %	0m

Please proceed with your chosen climb and we hope you enjoy the experience!

4. Please complete this page *AFTER* your fifth climb.

A. What was the letter of this climb? _____

- B. Now that you have done this climb, look over the route carefully again and remember what the climb was like. Think about risk and competence. Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Consider all of these risks for this climb. Please rate the **total risk** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Consider all six competences. Please rate your **total competence** by placing an 'X' on this line at the point which best represents your perception:

|-----|
None Low Medium High Extreme

C. Would you label your performance on this most recent climb as being sufficient or insufficient? ☐ SUFFICIENT ☐ INSUFFICIENT

D. Using your own criteria for evaluation, was your climb a success or a failure? ☐ SUCCESS ☐ FAILURE

E. What criteria did you use to evaluate your success or failure? _____

F. What do you think were the causes of your success or failure? _____

G. How did your success or failure make you feel? _____

H. Has your climbing competence increased or decreased as a result of this climb? ☐ INCREASED ☐ DECREASED

I. Next time, will you pick a climb with higher, lower, or the same risk? ☐ LOWER ☐ HIGHER ☐ THE SAME

5. After your climbing is done for the day, please complete this page.

990114

Please indicate your reflections for climbing and for yourself by placing an 'X' on each line at the point that best represents where your opinion falls between the two extremes. Please assess each pair of adjectives independently and separately from the others.

I THINK ROCK CLIMBING WAS...

Dangerous	_____	Safe
Definite	_____	Uncertain
Boring	_____	Exciting
Challenging	_____	Unchallenging
Easy	_____	Difficult
Protected	_____	Exposed
Harmless	_____	Harmful
Tense	_____	Relaxed
Threatening	_____	Comforting
Stimulating	_____	Calming
Negative	_____	Positive
Hazardous	_____	Secure

AS A CLIMBER, I THINK I WAS...

Unskilled	_____	Skilled
Bold	_____	Anxious
a Novice	_____	an Expert
Proficient	_____	Deficient
Experienced	_____	Unpractised
Weak	_____	Strong
Confident	_____	Hesitant
a Failure	_____	a Success
Unable	_____	Capable
Superior	_____	Inferior
Masterful	_____	Untalented
Vulnerable	_____	Invincible

Risk is not just physical (ie: bumping your head). Risk can be mental (getting pressured), social (being embarrassed) or emotional (feeling scared). Competence is your personal combination of skill, knowledge, attitude, behavior, experience and confidence. Competence is offered against risk. Please give your perceptions of the amount of **risk** inherent in rock climbing and for your personal **competence** at rock climbing after you climbed:

Risk	_____
None	Low Medium High Extreme
Competence	_____

6. *Before you return to work, please attend to these last few requests.*

Think carefully about your experience here today and feel free to talk or share with others. Reflect on what you have learned, how that learning applies to work and what you will do differently back on the job. **Thank you very much** for volunteering your valuable time to help in this important study.

Please summarize the key things you have learned from rock climbing: _____

Briefly describe how this new learning might apply to your job: _____

Please list a few work related things you will do differently in the future: _____

What is your gender? ☐ Male ☐ Female. How old are you? _____ years. Have you ever rock climbed before today? ☐ Yes ☐ No

Upon completing this booklet, please return it to the researcher who first gave it to you. Thanks!

Interview Questions

Questions to put Subjects at Ease

- *What do you remember most about the rock climbing day?
- *Why does that event stick out most in your mind?
- *What was that best thing you experienced on that day?
- *What was the worst thing you experienced on that day?
- *What made this (experience) the best?
- *What made this (experience) the worst?

Questions to Confirm Learning

- *What do you think was the most important thing you learned that day?
- *Why was that learning important to you?
- *What are some of the positive things about yourself that you have learned?
- *What made this learning positive?
- *What are some of the negative things about yourself that you have learned?
- *What made this learning negative?
- *Did you learn anything about yourself that surprised you?
- *Did you learn anything about yourself that didn't surprise you?
- *On that day, do you remember thinking how this learning might help you on the job?
- *If yes, could you tell me about it?

Questions to Establish Transfer

- *Have you done anything different at work as a result of your learning on this day?
- *Can you think of an example of how (specific climbing skill) applies to work?
- *Can you think of an example of how (non-specific skill) applies to work?
- *How was rock climbing like working here at CTAL for you?
- *Why was rock climbing like working here at CTAL for you?
- *Can you think of a strategy that helped you succeed at rock climbing that you could use here at work?
- *How feasible is using that strategy here?
- *What factors will help you or hinder you in trying out this new strategy?
- *Can you think of a barrier that got in your way while rock climbing?
- *Can you think of a barrier that has gotten in your way while working at CTAL?
- *What factors will help you or hinder you in trying to overcome this barrier?
- *How easily overcome is that barrier here at work?
- *Do you think that the rock climbing experience was meaningful to you?
- *Was the learning useful and effective when applied to the workplace?